FLORA SCOTICA; OR A DESCRIPTION OF SCOTTISH PLANTS, ...

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FLORA SCOTICA.

PART II.

CONTAINING

A SYNOPSIS OF THE SCOTTISH PLANTS

ARRANGED ACCORDING TO THE

NATURAL ORDERS.

[A]

Flora Scotica.

PART II.

CLASS I. ACOTYLEDONS. *Juss.*

(CRYPTOGAMIA, *Linn. Acotyledones, and part of Monocotyledones (Ferns), of Decand. and Brown. Agamæ and Exembryonatæ, Rich.*)

Fruit or organs of reproduction[a] without any *Cotyledon.*

Vegetation. In all, with the exception of the *Filices* or *Ferns,* the structure seems to be entirely cellular, and hence the term "*cellulares,*" applied to them by Decandolle, in opposition to "*vasculares,*" or those plants which, in addition to the cellular structure, have tubular vessels, as in the cotyledonous plants and the *Ferns*; on which account Decandolle and Brown have removed these latter into the 2d Class, Monocotyledons.

ORDER I. FUNGI[b]. *Linn.*

(*Fungi, and part of Algæ, Juss. Fungi, and part of Hypoxyla, Decand.*)

Plants growing upon the ground, or parasitic on other vegetable substances, rarely (never?) aquatics, and scarcely ever green; filamentous, gelatinous, spongy, corky, coriaceous, fleshy, or membranaceous. In the larger sense of the word, the whole may be considered as *fructification,* since distinct from it there is no stem, there are no branches, no leaves, no frond, and very rarely a simple crustaceous base. The *seeds* or *sporules* are either internal as in *Sphæria*, *Bovista*, or external as in *Agaricus,* &c. After being once dried they do not revive by the application of moisture, like the greater number of plants in this class; and, generally speaking, they are of very short duration, soon decaying, and frequently becoming putrid in decay.

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[a] The more intimately we become acquainted with the reproductive organs of the *Acotyledonous* or *Cryptogamic plants,* the more apparent is it, in my opinion, that there are no sexes as in the *Phænogamous* plants, no stamens and no pistil, nor any thing analogous to them; consequently no true *seed,* which can only be produced through their co-operation. The structure of the *seeds* themselves (more properly *sporules*) tends greatly to confirm such an opinion; there being, in reality, no distinction into *cotyledon, radicule,* or *plumule,* in short, no embryo, any more than there is in the little bulbs seen upon the stalks of the Onion tribe, and upon the *Polygonum viviparum,* &c., which, yet, equally produce perfect plants. A *sporule* has alike the power of producing, from every part of it, either stem or root, as circumstances may require: but it is quite otherwise with the true seed.—On this subject Professor Richard has ably written, both in his "*Dictionnaire de la Botanique,*" and in his "*Analyse du Fruit*;" the latter of which works, containing a valuable mass of information relative to fruits and seeds, has been translated and published by Mr. Lindley, with illustrative plates.

[b] The arrangement, divisions, and characters, both of the genera and the species of this order, are, for the most part, taken from the *Synopsis Methodica Fungorum* of *Persoon.*

DIV. I. ANGIOCARPI. *Seeds or sporules contained within the Fungus, which is closed, at least in an early stage, on all sides.*

SECT. I. SCLEROCARPI. *Fungi of a hardish nature externally, internally soft.*

1. SPHÆRIA.

Receptacle (or fungous substance) varying in form, or none. *Sphærules* roundish, when dry generally hollow; when moist filled with *seeds* included in a gelatinous substance.

* *Receptacle of the sphærules elongated, clavate.*

1. S. *Hypoxylon,* of a corky substance black compressed gregarious branched hairy at the base white and pulverulent at the extremity. *Pers. p.* 5. *Clavaria Hypox., Lightf. p.* 1059. *Sow. t.* 5.

HAB. Rotten trunks and stumps of trees, common. Autumn and winter, *Lightf., Hopk., Mr. Greville.*

2. S. *polymorpha,* of a substance between coriaceous and corky black generally simple gregarious rounded swelling upwards and there studded with the numerous sphærules. *Pers. Syn. p.* 7. *Clavaria digitata, Lightf. p.* 1058. *Sphæria dig., Sow. t.* 69.

HAB. Rotten stumps of old trees, in woods and shady places, *Lightf.* About Edinb. Aug. *Mr. Greville.*

** *Receptacle sessile, roundish, spreading; sphærules forming little points in all parts of the circumference.*

3. S. *concentrica,* obovate roundish large, within having many concentric lines. *Pers. p.* 8. *Sphæria fraxinea, Sow. t.* 160.

HAB. On the decayed trunks of ash trees, about Edinb., *Mr. Greville.*

4. S. *fragiformis,* rather small roundish gregarious confluent reddish, within black and shining, sphærules forming papillæ. *Pers. p.* 9. *Lycoperdon variolosum, Sow. t.* 271.

Hab. On rotten wood, frequent, Sept., *Hopk.*

5. S. *fusca*, roundish somewhat confluent brown nearly of the same colour within, sphærules umbilicated scarcely prominent. *Pers. p.* 12. *Sphæria tuberculosa, Lightf. p.* 1113. *Sow. t.* 374. *f.* 8.

Hab. On decayed wood, autumn, not uncommon, *Lightf., Hopk.* Rosslyn, on decayed branches of hazel, *Mr. Greville.*

6. S. *ribesia*, small bursting through the bark elliptical black somewhat depressed, sphærules whitish within. *Pers. p.* 14.

Hab. On the dead stems of Currant bushes about Edinb. Nov. *Mr. Greville.*

*** *Form various, spreading, orbicular, or rounded. Sphærules scattered, horizontal, imbedded in a fleshy substance; their orifices mostly prominent, papilliform, or spinulose.*

7. S. *poronia*, stipitate peziziform whitish, disk truncated, sphærules scattered punctiform black. *Pers. p.* 15. *Peziza punctata, Lightf. p.* 1050. *Sphæria punctata, Sow. t.* 54.

Hab. On dry horse- and cow-dung, *Lightf.* On dry dung-hills and old hot-beds, rare, *Hopk.*

8. S. *deusta*, broadly spreading thick undulato-rugose pustulate, at first fleshy greyish white, afterwards black and rigid. *Pers. p.* 16. *S. maxima, Sow. t.* 338.

Hab. On trunks of trees about Kinross. Sept. *Mr. Greville.*

9. S. *undulata*, naked thickish undulato-rugose, the orifices of the sphærules prominent roundish, receptacle of the sphærules whitish. *Pers. p.* 21.

Hab. Trunks of trees about Edinb. Aug. *Mr. Greville.*

About 2 inches wide, and 1—2 lines thick, surface undulato-rugose.

10. S. *Stigma*, spreading smooth rimose, orifices of the sphærules immersed nearly plane. *Pers. p.* 21. *Hypoxylon operculatum, Bull. Champ. t.* 478. *f.* 2.

β. *decorticata*, spreading longitudinally, orifices prominent, subconical. *S. decorticans, Moug. et Nestl. No.* 373.

Hab. α. On dead trunks of cherry-trees about Edinb. Sept. *Mr. Greville.* β. On the barkless stems of *Corylus avellana*, about Edinb. and Kinross. Sept. *Mr. Greville.*

11. S. *disciformis*, scattered orbicular nearly plane smooth, orifices immersed punctiform. *Pers. p.* 24.

Hab. Trunks of trees about Edinb. Autumn. *Mr. Greville.*

One to two lines broad, brown, bursting through the *epidermis*, white within.

12. S. *bullata*, depressed roundish oval or reniform, orifices papillose. *Pers. p.* 27. *S. depressa, Sow. t.* 216.

Hab. On the bark of decaying branches of trees, frequent. April. *Hopk.*

Larger than the last, black, with prominent orifices. White within.

**** *Spreading, sphærules horizontal, at first solitary at the margins, then confluent, not united, with a manifest fleshy substance or receptacle; sometimes distant, but united by some crust.*

13. S. *lata*, broadly spreading somewhat rugose opaque, sphærules somewhat prominent white within, orifices conical rough. *Pers. p.* 29.

HAB. Dead wood about Edinb. *Mr. Greville.*

14. S. *typhina*, subcompound elongate, parasitic on the culms of grasses. *Pers. p.* 29. *Ejusd. Ic. et Descr. Fung. fasc.* 1. *p.* 21. *t.* 7. *f.* 1. *Sphæria spiculifera, Sow. t.* 274?

HAB. On the culms of living grasses, about Edinb. Aug. *Mr. Greville.* On grass, rare, about Glasgow, *Hopk.*

Colour white at first and smooth, then orange yellow with the prominent *sphærules*, which are soft and solid. It precisely accords with Sowerby's *S. spiculifera*, except in wanting the spicules.

15. S. *striæformis*, gregarious in short striæ attenuated at each extremity quite smooth, sphærules concealed and without the appearance of orifices. *Pers. p.* 32.

HAB. On the dead stems of *Pteris aquilina*, about Edinb. Feb. *Mr. Greville.*

***** *Sphærules piercing the receptacle, and collected together into a distinct conical mass, the orifices converging towards the middle.*

16. S. *ferruginea*, bursting transversely through the bark black, orifices spinulose straight, sphærules imbedded within the receptacle in a ferruginous dust. *Pers. p.* 35.

HAB. On dead branches of hazel. Sept. *Mr. Greville.*

17. S. *Prunastri*, ventricose, orifices spinulose bursting through the bark 4-sided. *Pers. p.* 37.

HAB. On the dead stems of *Prunus spinosa*. Sept. *Mr. Greville.*

Growing under the *epidermis*, and bursting it transversely.

18. S. *nivea*, conical, disk farinaceous whitish, orifices prominent papillose. *Pers. p.* 38.

HAB. On dry oak branches, about Edinb. Aug. *Mr. Greville.*

Bursting through the *epidermis* of the bark, small; at first resembling a white spot. Internally white.

19. S. *corniculata*, much spreading beneath the epidermis black with the orifices resembling spicules thickish rounded umbilicate at the top. *Pers. p.* 40?

HAB. On decayed stems, about Edinb. Aug. *Mr. Greville.*

****** *Sphærules collected into a circle, decumbent, naked, beneath the epidermis; orifices approximate, generally protruded.*

20. S. *faginea*, circular, orifices hooked rough. *Pers. p.* 44?

HAB. On decayed stems, about Edinb. Aug. *Mr. Greville.*

******* *Bursting through the epidermis in small roundish clusters. Sphærules free, fixed on a receptacle.*

21. S. *decolorans*, clustered vermilion colour becoming paler,

sphærules globose rough with minute tubercles. *Pers. p.* 49. *Sphæria fragiformis, Sow. t.* 256.

Hab. On the dry branches of oaks, &c., about Edinb. Aug. *Mr. Greville.*

22. S. *coccinea*, clustered red, sphærules ovate smooth. *Pers. p.* 49. *Ejusd. Ic. et Descr. Fung. t.* 12. *f.* 2. *Sphæria Mori, Sow. t.* 255.

Hab. On dead wood, about Edinb. Aug. *Mr. Greville.*

******** *Sphærules solitary, free, destitute of a receptacle.*

23. S. *tubæformis*, simple growing upon leaves, sphærules together with the epidermis prominent ovate, orifices spinulose straight reddish. *Pers. p.* 60.

Hab. On the fallen leaves of *Corylus avellana*, about Edinb. Aug. *Mr. Greville.*

24. S. *hirsuta*, gregarious crowded quite black, sphærules ovate subtuberculated with scattered hairs, orifices somewhat angular obtuse. *Pers. p.* 73.

Hab. On dead wood, about Edinb. Aug. *Mr. Greville.*

25. S. *Peziza*, gregarious red, sphærules globose when dry concave by collapsion somewhat hairy at the base. *Pers. p.* 66. *Lycoperdon hydrophorum, Sow. t.* 23?

Hab. On dead wood, about Edinb. Aug. *Mr. Greville.*

26. S. *spermoides*, clustered opaque rigid, sphærules globose with the mouth papilliform obsolete. *Pers. p.* 75. *Lycoperdon nigrum, Lightf. p.* 1069. *t.* 31.

Hab. On dead wood. Autumn. *Lightf.* About Edinb., *Mr. Greville.*

27. S. *Patella*, scattered simple black, sphærules with the disk impressed from the folding in of the margins, orifice papillose subobsolete. *Pers. p.* 76.

On dead stalks of herbaceous plants, about Edinb. Sept. *Mr. Greville.*

28. S. *Doliolum*, simple scattered naked, sphærules prominent rounded obtuse, orifice papilliform. *Pers. p.* 78.

Hab. On dead wood and stalks of plants, Rosslyn. Aug. *Mr. Greville.*

Sphærules small, shining, roundish, conical, sometimes subdepressed. *Orifice* manifest, papilliform.

29. S. *Herbarum*, simple, sphærules scattered smooth for the most part depressed, orifices papillose. *Pers. p.* 78.

α. *complanata*, longer, sphærules for the most part naked collapsed. *S. complanata, Decand. S. concava, Sow. t.* 317.

γ. *tecta*, smaller, sphærules covered with the thin epidermis of the plant on which it grows, orifices prominent punctiform.

Hab. On the dead stems of herbaceous plants about Edinb. Sept. *Mr. Greville*; and on holly leaves, *Mr. Greville.* About Glasgow, *Hopk.*

30. S. *pulvis pyrius*, simple crowded, sphærules ovate or roundish tuberculated rugose sulcate in the middle. *Pers. p.* 86. *Moug. et. Nestl. No.* 381.

HAB. On dead wood, about Edinb. Sept. *Mr. Greville.*

31. S. *moriformis*, gregarious simple, sphærules tuberculated obovate. *Pers. p.* 86.

HAB. On dead wood, about Edinb. Sept. *Mr. Greville.*

32. S. *punctiformis*, simple epiphyllous punctiform, sphærules scattered umbilicated by collapsion, somewhat shining. *Pers. p.* 90.

β. Hederæ, larger depressed cupuliform.

HAB. β. On the underside of the leaves of *Hedera Helix*, about Edinb. Autumn. *Mr. Greville.*

33. S. *Ægopodii*, simple epiphyllous scattered, sphærules blackish inserted upon a paſe crustiform spot. *Pers. p.* 89.

HAB. On the leaves of *Ægopodium Podagraria*, about Edinb. July. *Mr. Greville.*

34. S. *strobilina*, simple scattered bursting through the epidermis, sphærules irregularly oblong black depressed in the centre. *Moug. et Nestl. No.* 572. *Hysterium conigenum. Pers. p.* 102?

HAB. On the decaying scales of the cones of firs. Autumn. *Mr. Greville.*

Growing on the outside of the scale, and confined to that part which is exposed when the scales are upon the cone.

2. HYSTERIUM.

Receptacle none. *Perithecium* for the most part oblong, opening with a longitudinal fissure.

1. H. *pulicare*, gregarious oblong or elliptical striated. *Pers. p.* 98. *Lichen scriptus β. pulicaris, Lightf. p.* 801 (*according to Pers.*).

HAB. On the bark of trees.

Differs from the genus *Opegrapha*, in having no crust.

2. H. *angustatum*, linear elongated subparallel smoothish. *Pers. p.* 99. *Moug. et Nestl. No.* 563. *Nees von Esenb. t.* 39. *f.* 303. *a.*

HAB. On dead wood about Edinb. August. *Mr. Greville.*

Very narrow, substance softer and more open than the latter; colour black, opaque.

3. H. *Fraxini*, bursting through the epidermis black subovate with the margins tumid. *Pers. p.* 100. *Sphæria sulcata, Sow. t.* 315.

HAB. On the branches of ash-trees, about Edinb. August. *Mr. Greville.*

4. H. *Pinastri*, bursting through the epidermis oval black shining. *Pers. p.* xxviii. *Moug. et Nestl. No.* 76.

Hab. On the dead leaves of *Pinus sylvestris*, about Edinb. Sept. *Mr. Greville.*

3. XYLOMA.

Receptacle (*perithecium*) various in form, hard, subcarnose within, remaining closed or opening in various ways.

* *Many Perithecia united into one body* (*Majora*).

1. X. *salicinum*, thick tuberculose, white and cartilaginous at the base within. *Pers. p.* 103. *Ejusd. Disp. Meth. Fung. p.* 5. *t.* 2. *f.* 4. *Xyloma leucocreas, Decand. Fl. Gall. p.* 63.

Hab. On the upper surface of the leaves of *Salix capræa*, at Castle Campbell. Sept. *Mr. Greville.*

2. X. *acerinum*, maculiform thin contiguous subrugose. *Pers. p.* 104.

Hab. On the leaves of *Acer pseudo-Platanus*, abundant in the autumn, *Mr. Greville.*

3. X. *rubrum*, crowded orbicular somewhat confluent orange red. *Pers. p.* 105. *Polystigma rubrum, Pers. in litt. Moug. et Nestl. n.* 270.

Hab. On the leaves of *Prunus spinosa*, Auchindenny woods. Autumn. *Mr. Greville.*

** *Simple. Perithecia solitary, scattered, for the most part rounded, pezizæform or punctiform* (*Minora*).

4. X. *alneum*, minute scattered roundish plicate. *Pers. p.* 108.

Hab. On fallen leaves of *Alnus glutinosa*, about Edinb. September. *Mr. Greville.*

4. TUBERCULARIA.

Receptacle somewhat hemisphærical, sessile. *Tubercle* filled with a thick, frequently red, fluid.

1. T. *vulgaris*, gregarious red sulcato-rugose, receptacle stipitiform thick pale. *Pers. p.* 112. *Sphæria tremelloides, Hopk. Glott. p.* 164. *Tremella purpurea, Lightf. p.* 901. *Clavaria coccinea, Sow. t.* 294.

Hab. On decaying sticks in the autumn. Common upon those of *Ribes rubrum, Hopk.; Mr. Greville.*

2. T. *confluens*, gregarious confluent flesh-coloured red, tubercles small roundish oblong and angular somewhat flat. *Pers. p.* 113.

Hab. Dead stems about Edinb. Autumn. *Mr. Greville.*

Very near *T. vulgaris*, but smaller and depressed, paler colour.

Sect. II. Sarcocarpi. *Fungi fleshy, solid.*

5. PILOBOLUS.

Receptacle stipitiform, pellucid and watery, upon which is fixed a naked *vesicle*, bursting open with an elastic force.

1. P. *crystallinus*, receptacle inflated upwards, vesicle hemisphærical black. *Pers. p.* 117. *Mucor urceolatus, Sow. t.* 300.

Hab. On horse-dung, early in the morning, *Hopk.*

Very fugacious. In an early stage it is a small yellow sessile *vesicle*, which, in a short time, acquires the pellucid inflated *receptacle* or *stipes*, upon the acuminated point of which the vesicle is inserted.

6. SCLEROTIUM.

Solid, varying in form, internally of one uniform texture, externally frequently corrugated.

1. Scl. *durum*, ovate hard somewhat striated dull black. *Pers. p.* 121.

Hab. On the dried stalks of herbaceous plants, about Edinb. Nov. *Mr. Greville.*

Elongated, and, for the most part, obtuse; often, however, of an indeterminate form, white within, substance tough.

2. Scl. *Erysiphe*, epiphyllous, granules aggregated brownish black fixed upon a white downy substance. *Pers. p.* 124.

β. *corylea*, down very minute, tubercles impressed upon the disk somewhat hairy. *Erysibe suffulta, Nees von Esenb. t.* 14. *f.* 134.

Hab. On the underside of the leaves of *Betula alba*, about Edinburgh. August. *Mr. Greville.*

7. TUBER.

Roundish, fleshy; *substance* variegated with seminiferous veins.

1. T. *cibarium*, blackish studded with wart-like excrescences. *Pers. p.* 126. *Sow. t.* 309. *Lycoperdon Tuber, Lightf. p.* 1064.

Hab. Subterraneous; found in the woods of Miggerney, in Glen Lyon, Perthshire, by *Mr. Menzies*, in the greatest perfection in autumn and winter, *Lightf.*

Roundish, 2—3 inches in diameter. These Fungi, under the name of Truffles, are greatly employed upon the continent for sauces of almost every kind. They are hunted for by dogs, who scratch them up with their feet; hogs likewise root them up with their snouts, and persons follow to secure them.

Sect. III. Dermatocarpi. *Membranaceous, coriaceous, or hairy Fungi, filled internally with the dust-like sporules.*

A. Trichospermi. *Seminal dust mixed with filaments.*

8. BOVISTA.

Peridium smooth, sessile, the exterior covering (*volva?*) white, and at length becoming partially evanescent, opening irregularly at the top. (*Seminal dust purplish brown.*)

1. B. *nigrescens*, large white at length becoming brownish black, beneath plicate. *Pers. p.* 137. *Lycoperdon globosum, Hopk. Glott. p.* 163. *Lycoperdon Bovista, Sow. t.* 331.

Hab. Dry fields, in the summer and autumn, *Hopk.*

Globose, or roundish oblong, opening with a large aperture.

9. LYCOPERDON.

Peridium caulescent, at length bursting at the extremity, covered externally with scaly warts, or small spinous processes.

1. L. *giganteum*, nearly stemless globose very large whitish, scales scattered obsolete. *Pers. p.* 140. *Lyc. Bovista, var. glabrum, Lightf. p.* 1066. *Lyc. Proteus*, upper figures, *Sow. t.* 332.

Hab. Meadows and pastures, King's Park, Edinburgh, &c. *Lightf.* Grows to a great size, 8 or 10 inches in diameter.

2. L. *Bovista*, large obconical soft palish white plicate beneath, scales broad. *Pers. p.* 141. *L. Bovista, var. maculatum, Lightf. p.* 1067. *L. Proteus, Sow. t.* 332, *lower figures.*

Hab. Meadows and pastures, *Lightf.*
2—4 inches broad.

3. L. *pratense*, white soft, *peridium* hemisphærical smoothish, warts few, stem very short. *Pers. p.* 142. *L. Bovista, var. granulatum. Lightf. p.* 1067.

Hab. Meadows and pastures, *Lightf.*

4. L. *excipuliforme*, large white varying in form, *peridium* somewhat globose, warts spinulose scattered, stem rounded long plicate. *Pers. p.* 143. *L. Bovista, var excipuliforme. Lightf. p.* 1067.

Hab. Meadows and pastures, *Lightf.*
These four are probably, as the older botanists considered them, varieties of each other, and are used indiscriminately as stiptics.

5. L. *pyriforme*, cæspitose pyriform umbonate pale brown, scales extremely minute, fibrous radicles long. *Pers. p.* 148.

Hab. On the ground in Castle Campbell, near Edinb. *Mr. Greville.*
2—3 inches high, studded all over with very minute elevated points.

10. LYCOGALA.

Peridium roundish, membranaceous, smooth, internally filled with a fluid pulpy mass, afterwards with seminal dust, mixed with a few filaments.

1. L. *argentea*, pulvinate subhemisphærical smooth of a silvery colour. *Pers. p.* 157. *Reticularia Lycoperdon, Sow. t.* 272.

Hab. On decayed trees and paling, in wet weather. On a fallen tree in Carmyle wood, plentiful, *Hopk.*

2. L. *miniata*, gregarious globose purplish red at first afterwards brownish, dust purplish. *Pers. p.* 158. *Lycoperdon Epidendrum, Lightf. p.* 1068. *Sow. t.* 52.

Hab. Rotten wood after rains, in autumn and spring, *Lightf., Hopk.*
Varies in colour.

11. FULIGO.

In its early stage pulpy and for the most part effuse, varying in form, externally rather compact and fibrous or hairy, membranaceous at the base, within fibroso-cellular and hairy, at length resolving into dust.

1. F. *flava*, effuse and roundish yellow externally cellular and fibrous. *Pers. p.* 161. *Reticularia lutea, Sow. t.* 399. *f.* 2. *Mucor septicus, Lightf. p.* 1073.

HAB. On grass and mosses occasionally. Aug. *Hopk. Mr. Greville.*

2. F. *vaporaria*, at first yellowish extending itself in a veiny or reticulated manner, when mature forming broad and thick masses cellular and fibrous olivaceous. *Pers. p.* 161. *Reticularia hortensis, Sow. t.* 399. *f.* 1.

HAB. On the tan in hot-beds and stoves, abundant, *Hopk. Mr. Greville.*

The pest of plants in the tan-pit, running in one night's time up their stem from the tan, and covering them with a slimy yellow matter, which soon dries; when, under a thin crust, is seen a greyish or olivaceous powder, which disseminates itself in all directions.

12. DIDERMA.

Peridium generally double; *ext.* fragile; *int.* pellucid, rather distant from the outer one. *Columella* large, roundish. *Threads*, or *filaments*, few, buried among the *sporules.*

1. D. *globosum*, stemless smooth globoso-hemisphærical white. *Pers. p.* 167. *Sturm's Fungi, t.* 6.

HAB. On dead beech leaves at Braid Hermitage, Edinb., *Mr. Greville.* A minute but very pretty little fungus.

2. D. *vernicosum*, stipitate collected together reddish brown ovate shining, stipes short whitish. *Pers. p.* 165. *Obs. Mycol.* 1. *p.* 89. *t.* 3. *f.* 7. *Leiocarpus vernicosus, Nees von Esenbeck, t.* 9 *f.* 110. *Sphærocarpus fragilis, Sow. t.* 279.

HAB. Upon the stems of mosses about Edinb. Autumn. *Mr. Greville.*

13. PHYSARUM.

Peridium rigid simple, for the most part rugulose somewhat farinaceous. *Filaments* scattered, united generally in a reticulated manner amongst the sporules.

1. P. *nutans*, stipitate greyish white, peridium lenticular glabrous rugulose drooping. *Pers. p.* 171. *Trichia alba, Sow. t.* 259.

HAB. On rotten sticks, on the peat in wet moors, frequently. *Hopk.*
Peridium umbilicate beneath. *Dust* dark brown. *Stipes* somewhat attenuated, brownish.

14. TRICHIA.

Peridium at length bursting irregularly, persistent. *Tuft* of *filaments* compact, adhering to the base of the peridium within, and expanding elastically.

1. Tr. *ovata*, clustered sessile obovate opaque brownish yellow. *Pers. p.* 180. *Trichia turbinata, Sow. t.* 85. *Lycoperdon epiphyllum, Lightf. p.* 1069.

HAB. Upon dead leaves, moss and rotten wood in the winter, *Lightf.* Small, closely crowded.

15. ARCYRIA.

Peridium with its upper part evanescent. *Tuft* of *filaments* naked, fixed into the cup-shaped *receptacle*.

1. A.? *leucocephala*, gregarious, peridium funnel-shaped orange brown, tuft of filaments globose. *Pers. p.* 183. *Hoffm. Germ. v.* 2. *t.* 6. *f.* 1. *Craterium leucocephalum, Sturm's Fungi, t.* 11.

Hab. On moss upon the Pentland hills, *Mr. Greville.*

A very elegant minute species, funnel-shaped, with a pale evanescent convex extremity, on the disappearance of which the whitish filaments protruded in a more or less globular form. Nearly allied to this is the *Cyathus minutus, Sow. t.* 239.

2. A. *flava*, subgregarious yellow, tuft of filaments very long drooping. *Pers. p.* 184. *Trichia nutans, Sow. t.* 184.

Hab. On mosses about Edinburgh. Autumn. *Mr. Greville.*

3. A. *punicea*, crowded red. *Pers. p.* 185. *Clathrus denudatus, Linn. Trichia denudata, Sow. t.* 49.

Hab. Decaying sticks, about Edinb., *Mr. Greville.*

16. STEMONITIS.

Peridium very thin, subevanescent. *Tuft* of *filaments* forming a net-work, somewhat compact, surrounding, and fixed to, a central *style*.

1. S. *fasciculata*, tufted head of filaments subattenuated, the outer coat entirely evanescent. *Pers. p.* 187. *Clathrus nudus, Linn. Trichia nuda, Sow. t.* 188.

B. Gymnospermi. *Seminal dust without filaments.*

17. LICEA.

Peridium free, roundish or slightly spreading, fragile, without any subjacent membrane. Seminal *dust* destitute of filaments.

1. L. *circumscissa*, gregarious fulvous, peridium bursting all round transversely. *Pers. p.* 196. *Ejusd. Obs. Myc.* 1. *t.* 6. *f.* 1. and 2. *Sphærocarpus sessilis, Bull. Champ. t.* 417. *f.* 5.

Hab. On the dead bark of trees about Edinburgh. Autumn. *Mr. Greville.*

At first sight resembling the eggs of some insect. *Peridium* minute, globose, of a dirty yellow, at length fulvous and separating horizontally into two equal parts. *Dust* quite naked, or with one or two minute *filaments* intermixed. *Pers.*

18. MUCOR.

Peridium membranaceous, globose, stipitate, at first pellucid and watery, afterwards becoming opaque. *Sporules* naked, somewhat cohering. (*Minute fugacious Fungi.*)

1. M. *Mucedo*, stipes simple, peridium inflated blackish grey, orifice roundish opening around the stipes. *Pers. p.* 201.

β. *vulgaris*, crowded heads very minute blackish. *Mucor Mucedo, Linn.*; *Hopk. Glott. p.* 165; *Sow. t.* 378. *f.* 5, 6, *and* 7.

Hab. On putrid wood, bread, and vegetables, at all seasons of the year. *Hopk.*

2. M.? *Embolus*, "stem black bristle-shaped set with brown woolly hair." *With. Bot. Arr. ed.* 4. *v.* 4. *p.* 395.

Hab. Found on rotten wood at all seasons, *Hopk.*

19. ÆCIDIUM.

Peridia (stemless) manifest, rounded, membranaceous, at length opening with a dentated orifice. *Sporules* farinaceous, naked. (*Parasitic on leaves.*)

Cæspitose. Peridia crowded together so as to form a crustaceous spot upon the leaves.

1. Æ. *cornutum*, yellowish peridia very long curved olivaceous grey. *Pers. p.* 205. *Sow. t.* 319.

Hab. On the leaves of *Sorbus Aucuparia*, at Rosslyn, Slateford, &c. August. *Mr. Greville.*

A singular plant, growing on the under side of the leaves, but forming a yellow spot in the upper.

2. Æ. *Tussilaginis*, forming a purplish yellow spot, peridia immersed nearly plane on their surface. *Pers. p.* 209. *Sow. t.* 397. *f.* 1. *Lycoperdon epiphyllum, Hopk. Glott. p.* 164.

Hab. On the back of the leaves of *Tussilago Farfara*, very common, *Hopk. Mr. Greville.*

3. Æ. *Berberidis*, cæspitose orbicular small convex, peridia somewhat elongated yellow. *Pers. p.* 209. *Sow. t.* 397. *f.* 5.

Hab. On the leaves of *Berberis vulgaris.* This has been frequently supposed to be the origin of the blight in wheat, but I suspect from a common idea that the two plants are the same species.

20. UREDO.

Peridium none. *Dust* naked, easily dispersed. *Sporules* uniform, generally globose.

* *Dust yellowish* (*Rubigo, or Rust*).

1. U. *Alchemillæ*, crowded yellow and bursting the epidermis in somewhat parallel lines. *Pers. p.* 215.

Hab. Upon the leaves of *Alchemilla vulgaris.* Sept. *Mr. Greville.*

Mr. Greville observes that his specimens differ somewhat from the description of Persoon. The *sporules* are brown, and the leaves upon which they grow are not smaller than the rest; contrary to the observation of that author.

2. U. *Euphorbiæ Helioscopiæ*, scattered somewhat globose prominent yellow. *Pers. p.* 215.

Hab. On the leaves of *Euphorbia Helioscopia*, at Arlary and Kinross. September. *Mr. Greville.*

3 U. *miniata*, roundish effuse orange-colour. *Pers. p.* 216.

Hab. On the leaves of roses about Edinburgh. *Mr. Greville.*

4. U. *linearis* (*α. Frumenti*), linear very long brownish yellow becoming darker. *Pers. p.* 216. *Uredo longissima, Sow. t.* 139.

Hab. On the stems of grasses about Edinburgh. Aug. *Mr. Greville.* This is considered by some authors to be the young of *Puccinia Graminis.*

5. U. *Sonchi,* crowded somewhat confluent yellow, clusters flattish irregular. *Pers. p.* 217.

Hab. On the leaves of *Sonchus oleraceus,* about Edinburgh. Autumn. *Mr. Greville.*

6. U. *farinosa,* confluent farinose ochraceous. *Pers. p.* 217.

Hab. On the leaves of *Salix capræa,* about Edinb. Aug. *Mr. Greville.*

7. U. *Tussilaginis,* in sub-concentric orange-coloured spots. *Pers. p.* 218.

Hab. On the leaves of *Tussilago Petasites,* Rosslyn, and about Edinburgh. August. *Mr. Greville.*

8. U. *populina,* crowded yellow unequal blistered generally closed. *Pers. p.* 219.

β. betulina, crowded yellowish minute rounded closed.

Hab. On the leaves of *Populus balsamifera* and *tremula*; *β.* on the leaves of *Betula alba,* about Edinburgh. *Mr. Greville.*

9. U. *Menthæ,* scattered orbicular flattish pale brownish. *Pers. p.* 220.

Hab. On the leaves of *Mentha arvensis,* Arlary and Kinross. Sept. *Mr. Greville.*

** *Dust brown or blackish* (*Nigredo*).

10. U. *suaveolens,* confluent fragrant unequal, dust pale brownish purple. *Pers. p.* 221.

Hab. On the leaves of *Cnicus arvensis,* King's Park, Edinburgh. June, July. *Mr. Greville.*

*** *Dust white* (*Albugo*).

11. U. *candida,* diffuse white. *Pers. p.* 223.

α. Thlaspeos, large bursting the epidermis with a profuse dust. *Uredo Thlaspi, Sow. t.* 340. U. *cruciferarum, Decand. p.* 49?

Hab. Upon the stems of *Thlaspi Bursa-Pastoris,* and upon the leaves of various cruciforn plants.

**** *Dust blackish or brown, parasitic within the fructification of plants.* (*Ustilago, Smut.*)

12. U. *Segetum,* dust or sporules naked copious black within the fruit or glumes of grasses. *Pers. p.* 224. *Mougeot and Nestl. No.* 291. *Reticularia Segetum, Bull. t.* 422. *f.* 2. *Ustilago Segetum, Link in Sturm's Deutsch. Flora.*

Hab. In the fructification of grasses, especially of wheat, barley, and oats.

This is a fungus which does considerable injury to corn, particularly to the wheat crops by destroying the grain and converting it wholly into black dust, known by the name of *brand, dust brand, smut, burnt corn,* &c. It has, however, no scent like the following, and does not affect the whole mass in the thrashing.

13. U. *Caries*, sporules minute inclosed in peridia of a brownish black colour, and filling the grain with a fetid powder. *U. sitophila, Ditmar in Sturm's Deutsch. Fl. wth a fig.*

Hab. The inside of the grains of wheat.

It is not a little remarkable that I can find no account of this little fungus, the most injurious perhaps of all the tribe to the agriculturist, in any botanical work but that above quoted; except, indeed, that it is said in the *Nouveau Dictionnaire d'Hist. Nat.* now publishing, to be the *Uredo Caries* of *Decand.;* but I know not in what work of that author, for most assuredly it is not in the *Flore Françoise.* It is, according to *Ditmar,* a distinct genus from the foregoing, inasmuch as its *sporules* are included in a sort of *capsule* or *peridium,* which he calls *sporidium.* It affects the kernel of wheat in a different manner from that, not appearing externally, though its presence may be known by the somewhat smaller, yet inflated, appearance of the grain, and its darker colour. When broken it is greasy to the touch, and has a fetid smell, which may be aptly compared to that of *Chenopodium olidum.* It is not merely that a vast quantity of grain is destroyed by the action of this *fungus* upon each separate kernel it attacks, but, in the operation of thrashing, the injured kernels are broken, and the soil and smell are communicated to the whole sample.

21. PUCCINIA[*].

Peridia having dissepiments, stipitate.

Parasitic on the stalks or leaves of plants.

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[*] A German author, M. Strauss, unites, I think with propriety, the genera *Stilbospora* and *Puccinia* with *Uredo,* which he subdivides in the following manner.

UREDO.

Pulverulent Fungi. Capsules (*Thecæ, Sporulæ*) collected into a pulverulent cluster, for the most part covered with the epidermis.

A. *Fungi growing upon wood.* (*Colour black.*) Stilbospora.

B. *Fungi parasitic on the fructifications of plants.* (*Colour black.*) Ustilago.

C. *Fungi parasitic upon leaves.*
  1. *Capsules destitute of dissepiments.*
    a. *Colour white.* Albugo.
    b. *Colour yellowish.* Rubigo.
    c. *Colour obscure, becoming black.* Nigredo.
  2. *Capsules furnished with dissepiments.* Puccinia.

1. P. *Menthæ*, scattered punctiform dark brown, sporules? (peridia) sub-quadrangular, stipes very short. *Pers. p.* 227.

Hab. On the leaves of *Mentha hirsuta*, at Duddingston Loch, near Edinburgh. September. *Mr. Greville.*

2. P. *Valantiæ*, scattered blackish brown, peridia fusiform. *Pers. p.* 227.

Hab. On the leaves of *Galium cruciatum*, about Edinburgh. Sept. *Mr. Greville.*

3. P. *Polygoni amphibii*, opaque brown depressed, peridia oblongo-ovate attenuated into the footstalk. *Pers. p.* 227.

Hab. On the leaves of *Polygonum amphibium*, about Edinburgh. August. *Mr. Greville.*

4. P. *Polygoni avicularis*, sublinear scattered brown, peridia globose. *Pers. p.* 227.

Hab. On the leaves of *Polygonum aviculare*, about Edinburgh. September. *Mr. Greville.*

5. P. *Asparagi*, scattered brown ovato-oblong convex much crowded in the disk, peridia oblong obtuse 2-celled. *Decand. Fl. Gall. Syn. p.* 45. *Moug. et Nestl. No.* 392.

Hab. Upon the stalks of dead cabbages, *Mr. Greville.*

6. P. *Circææ*, scattered verruciform red brown, peridia ovate acute. *Pers. p.* 228.

Hab. On the leaves of *Circæa Lutetiana* and *alpina*, Castle Campbell, and Rumbling Brigg. September. *Mr. Greville.*

7. P. *Graminis*, crowded linear becoming black, peridia somewhat turbinated. *Pers. p.* 228. *Uredo Frumenti, Sow. t.* 140. *Sir Jos. Banks's Essay on the Blight in Corn, in the* 2d *vol. of Annals of Botany, p.* 51. *t.* 3 *and* 4.

Hab. On the stems and leaves of corn, and various grasses, too common.

This is that disease so well known to agriculturists by the names of *blight, mildew,* and *rust* in corn. Strauss says, that "the *Uredo linearis* of this work (*U. longissima of Sow.*) is but the young state of it." For a scientific history of this injurious plant, I must refer to the Essay of Sir Jos. Banks, above cited, and to a paper written by my friend, the Rev. Mr. Kirby, in the 5th vol. of the *Linn. Trans. p.* 102. The plates quoted in the former work do not do justice to the inimitable drawings of this *Fungus*, made by Mr. Bauer, for Sir Jos. Banks. An unpublished engraving, from the original drawing, presented to me by Sir Joseph, I have deposited in the portfolio of drawings at the Royal Botanic Garden, Glasgow. It is to be lamented, that no certain cure for this disease has yet been discovered; a true knowledge of its structure, however, may tend to this desirable end.

8. P. *mucronata*, crowded black stipitate cylindrical mucronate, 3—5-celled, footstalk incrassated at the base. *Pers. p.* 230. *Nees von Esenbeck, t.* 1. *f.* 14. *P. Rubi, Sow. t.* 400. *f.* 9.

α. *Rosæ*, peridia thickish rather obtuse. *P. Rosæ, Decand.*

β. *Rubi*, crowded resembling black hairs, peridia subattenuated. *P. Rubi, Decand.*

Hab. α. On the leaves of roses. β. On those of *Rubus idæus* and *fruticosus*, about Edinburgh. September. *Mr. Greville.*

C. Sarcospermi. *Fructifications (peridia?) of a large size, fleshy.*

21. CYATHUS.

Receptacle funnel- or cup-shaped, at first closed at the orifice with a membrane, including several lentiform *vesicles.*

1. C. *striatus*, hairy brown internally striated. *Pers. p.* 237. *Nidularia striata, Sow. t.* 29. *Peziza striata, Lightf. p.* 1049.

Hab. On old decaying timber, sticks and straws, and sometimes on the ground, in the spring and autumn, *Lightf.*

2. C. *Olla*, externally ash-coloured or brownish somewhat downy internally smooth lead-coloured. *Pers. p.* 237. *Peziza lentifera, Lightf. p.* 1048. *Nidularia campanulata, Sow. t.* 28.

Hab. Old decaying timber, sticks, straws, &c., spring and autumn, *Lightf.*

3. C. *Crucibulum*, subcylindrical indurated slightly downy (or glabrous) tawny yellow. *Pers. p.* 238. *Nidularia lævis, Sow. t.* 30. *Peziza crucibuliformis, Lightf. p.* 1049.

Hab. On decaying wood, autumn and winter, *Lightf. Mr. Greville.*

Div. II. Gymnocarpi. *Fleshy Fungi, bearing seeds externally upon the receptacle (or hymenium).*

Sect. I. Lytothecii. *Fructifying surface (hymenium) dissolving into a gelatinous mass.*

22. PHALLUS.

Inclosed (at first) with a *Volva. Pileus* ovate, stipitate, entire, covered with the gelatinous fluid mass.

1. P. *fœtidus*, stipes perforated somewhat oblique, pileus cellular open at the extremity. *P. impudicus, Pers. p.* 242. *Lightf. p.* 1044. *P. fœtidus, Sow. t.* 329.

Hab. Woods and banks, but not common, at Blair in Athol; sands by the sea on both sides of the Firth of Forth, and at Carubber Bank, *Sibbald.* Woods and under hedges, frequent about Glasg., *Hopk.* Autumn.

The abominably strong smell of this plant has procured it the names of *stinking morel* and *stink-horns.* There is an admirable description and history of it in *Curt. Fl. Lond.*

SECT. II. HYMENOTHECII. *Receptacle of the fructification, a permanent membrane with pulverulent sporules.*

A. AGARICOIDEI. *Membrane forming plates (or gills), or veiny.*

23. AMANITA.

Bursting from a *Volva*. *Pileus* fleshy, generally warted. *Gills* crowded, nearly entire. *Stipes* mostly elongated, annulate, or naked.

1. A. *muscaria*, pileus orange-red or brown shining at length nearly plane, the warts gills and stipes white, stipes annulate. *Agaricus muscarius*, *Sow. t.* 286.

α. Pileus orange-red. *A. muscaria*, *Pers. p.* 253. *Agaricus muscarius*, *Lightf. p.* 1010.

β. Pileus brownish. *A. aspera*, *Pers. p.* 254. *Agaricus verrucosus*, *Bull. t.* 316. *Curt. Fl. Lond. with a fig. Lightf. p.* 1012.

HAB. Woods, not unfrequent. Autumn. *Lightf.*

This is one of the largest, and, at least the var. *α*., the most beautiful of all the Agaric tribe. It is, however, esteemed of an acrid and deleterious quality. Steeped in milk it is set in Sweden to decoy and kill flies, and, by rubbing on the bedsteads and other furniture, to destroy bugs. It is nevertheless said to be eaten by the Russians, and that the natives of Kamschatka prepare an inebriating liquor from this, and the runners of *Epilobium angustifolium*; but, if taken in too large a dose, it produces trembling of the nerves, intoxication, delirium, and melancholy.

24. AGARICUS[*].

Volva none. *Pileus* with gills beneath, differing in substance from the rest of the plant.

* *Stipes central.*

† *Stipes solid and decurrent.*

+ *Gills white.*

1. A. *fragrans*, gills white four in a set, pileus brownish white semitransparent, stipes brownish white. *With. p.* 158. *Sow. t.* 10.

HAB. Fir woods, near Helensburgh, but not plentiful, *Hopk.*

2. A. *velatus*, gills greyish white much branched, pileus convex entirely covered by the membranaceous curtain. *With. p.* 161. *Ag. glutinosus*, *Sow. t.* 7.

HAB. Fir woods, not unfrequent. Woods near Kenmuir. Sept. *Hopk.*

++ *Gills brown.*

3. A. *lactifluus*, gills red brown, pileus dark red brown, stem

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[*] Both in this and the following most intricate genera, I follow the arrangement and adopt the specific characters of Withering, since almost my only knowledge of the species hitherto found in Scotland, is derived from the *Fl. Glottiana* of *Mr. Hopkirk*; and that gentleman refers exclusively to the "*Botanical Arrangement*;" so that I have no means of ascertaining what the species are of other authors. My edition of *Withering's Arrangement* is the 4th.

somewhat buff-coloured, juice white milky mild. *With. p.* 165. *Lightf. p.* 1012. *Schæff. t.* 5. *Sow. t.* 204.

Hab. Woods, frequent, *Lightf.* Bothwell Wood, *Hopk.*

Lightfoot says this is one of the best kinds for the table; but such assertions should be received with great caution, for Withering tells us, that, on tasting it, it leaves a pungent sensation on the tongue.

+++ *Gills red.*

4. A. *piperatus*, gills pale pinky red numerous in pairs, pileus dirty yellow white woolly depressed in the centre, stipes pale yellow. *With. p.* 169. *Lightf. p.* 1013. *Sow. t.* 103.

Hab. Woods, frequent. Blair in Athol. Autumn. *Lightf., Dickson.*

++++ *Gills purple.*

5. A. *amethystinus*, gills purple 2 3 or 4 in a set, pileus purple convex, stipes pale purple cylindrical. *With. p.* 176. *Sow. t.* 157.

Hab. Woods, occasionally, as Carmyle wood. Autumn. *Hopk.*

6. A. *rutilus*, gills reddish purple leathery few in pairs, pileus red; disk purple fleshy, stipes reddish purple cylindrical. *With. p.* 177. *Schæf. t.* 55. *Sow. t.* 105.

Hab. Fir woods, but not very common, in the autumn, *Hopk.*

†† *Stipes solid and fixed.*

+ *Gills white.*

7. A. *crassipes*, gills white brownish at the edges fleshy distant 4 in a set, pileus reddish brown bossed cracking, stipes greatly tapering downwards ribbed. *With. p.* 180. *Schæff. t.* 88. *Sow. t.* 129.

Hab. On the roots of decayed trees. Aug., Sept. *Hopk.*

8. A. *stipitis*, gills brownish white 4 in a set, pileus pale brown darker and woolly in the centre, stem pale brown with a buff tinge thicker and bulbous at the base, ring white permanent. *With. p.* 187. *Bolt. t.* 136. *Sow. t.* 101.

Hab. Stumps of trees, common, frequently in clusters, *Hopk.*

9. A. *integer*, gills white mostly uniform, pileus of various tints, stipes white. *With. p.* 190. *Lightf. p.* 1009. *Sow. t.* 201.

Hab. Woods, frequent. Autumn. *Lightf., Hopk.*

10. A. *elephantinus*, gills yellowish white fleshy distant 4 in a set, pileus brownish yellow changing to black and cracking, stipes white. *With. p.* 194. *Sow. t.* 36.

Hab. Woods, occasionally. Plantation opposite Dalbeth-house, frequent, *Hopk.* Autumn.

++ *Gills purplish.*

11. A. *violaceus*, gills purple numerous 8 in a set, pileus varying from purple to brown convex, edge turned down, stipes purple cylindrical. *With. p.* 203. *Lightf. p.* 1018. *Sow. t.* 209? (*the stipes is cottony*).

Hab. On the ground in gardens and in grass walks, but not common. Autumn. *Hopk.* Woods, frequent, *Lightf.*

††† *Stipes solid and loose.*

+ *Gills white.*

12. A. *Orcadis*, gills brownish watery white 2—4 in a set, pileus pale brown convex irregular, stipes whitish brown with age very tough rarely central. *With. p.* 217. *A. coriaceus, With. p.* 217.

Hab. On the ground in pastures, frequently forming *fairy rings.* June—Oct. *Lightf., Hopk.*

13. A. *horizontalis*, gills yellowish white 4 in a set, pileus yellowish brown convex not fully circular, stipes bent horizontally. *With. p.* 220. *Bull. t.* 324.

Hab. On old trees in the autumn, especially after rain, *Hopk.*

14. A. *clavus*, gills white in pairs, pileus with a dimple in the centre, stipes very long and slender, root very long. *With. p.* 220. *Lightf. p.* 1027.

Hab. On decayed leaves and among moss, *Lightf.*

Very minute, scarcely an inch high.

15. A. *Georgii*, gills yellowish white, pileus yellow convex hollow in the centre, stipes yellow thickish smooth, juice yellow. *With. p.* 222. *Sow. t.* 304.

Hab. Pastures, occasionally growing to a large size, *Hopk.*

Although Mr. Sowerby seems to think this may prove only a var. of the *common Mushroom* (*A. campestris*); and although they are sold in large quantities in London for that species, yet he remarks that their dry and tough quality renders them unfit for the table in any shape. The *gills* in age become, according to Sowerby's figure, a dirty brownish purple[a].

++ *Gills red.*

16. A. *campestris*, gills pinky changing to dark liver colour crowded irregular, pileus convex varying from white to brown, stipes white cylindrical, curtain white. *With. p.* 225. *Lightf. p.* 1017. *Sow. t.* 305.

Hab. Dry pastures after rains, frequent, *Lightf., Hopk.*

This is the common mushroom which is so much esteemed for sauces, stews, and for converting into catchups. It is cultivated by the spawn or seeds; and, in Russia, in large houses built for the purpose: so that the inhabitants have them the whole year through.

+++ *Gills buff-coloured.*

17. A. *hinnuleus*, gills buff very broad 4 in a set, pileus fawn-coloured convex mealy, stipes chesnut colour. *With. p.* 228. *Sow. t.* 173.

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[a] Mr. Hopkirk speaks of a mushroom, "probably of this kind," found near Paisley, which was 9 inches high, 43 in circumference, and weighed 5 pounds 6 ounces.

Hab. Fir woods, in autumn, not uncommon, *Hopk.*

++++ *Gills yellow.*

18. A. *luteus*, gills yellow numerous uniform, pileus yellow conical tufted, stipes tapering upwards. *With. p.* 229. *A. Cæpæstipes, Sow. t.* 2 (*left-hand figures*). *W.*

Hab. Amongst the bark in stoves and hot-beds, but not common. Aug. *Hopk.*

†††† *Stipes hollow and decurrent.*

+ *Gills white.*

19. A. *niveus*, gills white in pairs, pileus white viscid flattish, stipes white cylindrical. *With. p.* 231 (*not of Sow.*).

Hab. In exposed pastures, among moss on the moors, *Hopk.*

++ *Gills red.*

20. A. *farinaceus*, gills pale pink edges scolloped 4 in a set, pileus pinky brown bossed, stipes very pale pinky brown thick at the top. *With. p.* 232. *Schæff. t.* 13. *Sow. t.* 208.

Hab. Woods, on the ground; but not common. Autumn. *Hopk.*

+++ *Gills yellow.*

21. A. *parvus*, gills yellow in pairs (about 20 pairs), pileus orange dimpled, stipes orange. *With. p.* 233. *A. Fibula, Sow. t.* 45.

Hab. Amongst short grass and moss, occasionally. Aug. *Hopk.*

††††† *Stipes hollow and fixed.*

+ *Gills brown.*

22. A. *tener*, gills nut-brown 4 in a set extending below the edge of the pileus, pileus deep buff bluntly conical dark brown at the edge, stipes nut-brown smooth splitting. *With. p.* 245. *Schæff. t.* 70. *Sow. t.* 33.

Hab. Among short grass and on moors. Autumn. *Hopk.*

23. A. *clypeatus*, gills greyish brown 4—8 in a set, pileus pale brown convex bossed viscid, stipes white viscid. *With. p.* 248. *Lightf. p.* 1020.

Hab. Woods and pastures. Autumn. *Lightf.*

++ *Gills red.*

24. A. *cinnamomeus*, gills deep tawny red broad about the middle 4 in a set, pileus rich cinnamon convex somewhat bossed, stipes yellow. *With. p.* 252. *Lightf. p.* 1019. *Sow. t.* 206.

Hab. Woods, not unfrequent. Autumn. *Lightf.*

+++ *Gills yellow.*

25. A. *aurantius*, gills yellow fleshy 8 in a set, pileus conical orange edge uneven, stipes yellow splitting. *With. p.* 256. *Lightf. p.* 1025. *Curt. Fl. Lond.*, *with a fig.* *Sow. t.* 381.

Hab. Dry pastures. Autumn. *Lightf.* Meadows and heaths, frequent, *Hopk.*

26. A. *ceraceus*, gills pale yellow in pairs, pileus deep yellow hemisphærical smooth, stipes deep yellow cylindrical. *With. p.* 258. *Sow. t.* 20.

Hab. Amongst grass, not common. Sept. *Hopk.*

††† *Gills grey.*

27. A. *semiglobatus*, gills grey mottled 4—8 in a set edge horizontal, pileus greenish yellow semi-globular, stipes pale buff. *With. p.* 265. *Curt. Fl. Lond. ed.* 2. *with a fig. Sow. t.* 248, and *t.* 407 (*A. virosus.*) *A. glutinosus, Curt. Fl. Lond. ed.* 1. *with a fig.*

Hab. On the ground every where, common. July—Oct. *Hopk.*

Highly poisonous according to Sowerby, who has given a long account of the species under *t.* 407.

†††††† *Stipes hollow and loose.*

† *Gills white.*

28. A. *procerus*, gills white uniform fixed to a collar, pileus a broad cone bossed whitish brown scaly, stipes scaly, ring loose. *With. p.* 266. *Sow. t.* 190. *A. annulatus, Lightf. p.* 1025.

Hab. Woods and shady places. Autumn. *Lightf., Hopk.*

29. A. *stercorarius*, gills white, pileus very thin white or brownish flat or bossed edge rolled up, stipes white enlarged downwards. *With. p.* 269. *Sow. t.* 262.

Hab. On dung-hills in the autumn, frequent, *Hopk.*

30. A. *clypeolarius*, gills white numerous 4 in a set, pileus convex bossed pale brown mottled, stipes smooth. *With. p.* 270. *Sow. t.* 14.

Hab. Woods and fir plantations, but not common. Bothwell wood, near the west gate. Aug., Sept. *Hopk.*

31. A. *alliaceus*, gills white irregular, pileus dark brown at the top pale at the edge, stipes almost black, root crooked knobbed. *With. p.* 271. *Sow. t.* 81.

Hab. Occasionally on rotten wood, in plantations, smelling like garlick. Aug., Sept. *Hopk.*

32. A. *congregatus*, gills white with grey edges 2—4 in a set, pileus conical brown buff, sides furrowed, stipes white smooth. *With. p.* 275. *Sow. t.* 261.

Hab. On stumps of trees and at the bottoms of posts, frequent. Aug. —Oct. *Hopk.*

†† *Gills red.*

33. A. *cylindricus*, gills pinky uniform, pileus white cylindrical scaly, stipes cylindrical white. *With. p.* 280. *A. fimetarius, Curt. Fl. Lond. ed.* 1. *Sow. t.* 189.

Hab. Gardens, pastures, and amongst rubbish, during the summer and autumn, frequent, *Hopk.*

Gills becoming black in age.

34. A. *lachrymabundus*, gills dull red broad numerous 2—4 in

a set, pileus dirty brown conical woolly, stipes hollow dirty white. *With. p.* 282. *Sow. t.* 41.

Hab. Woods, occasionally. Woods, Bothwell. Aug., Sept. *Hopk.*

+++ *Gills buff-coloured.*

35. A. *dryophyllus*, gills pale brownish buff broad few 4 in a set, pileus dead whitish colour nearly flat, stipes white gently tapering upwards. *With. p.* 282. *Sow. t.* 127.

Hab. Pastures and woods, not uncommon. Aug., Sept. *Hopk.*

++++ *Gills yellow.*

36. A. *equestris*, gills brimstone yellow 4 in a set, pileus pale yellow convex, stipes yellow cylindrical. *With. p.* 285. *Lightf. p.* 1019. *Schæff. t.* 79. *Bolt. t.* 65.

Hab. Dry pastures and woods. Autumn.

+++++ *Gills grey.*

37. A. *ovatus*, gills silvery grey uniform, pileus grey brown plaited, stipes white. *With. p.* 286. *Curt. Fl. Lond. ed.* 1. *A. fimetarius*, *Sow. t.* 188.

Hab. On the roots of trees in Carmyle wood. Autumn. *Hopk.*

38. A. *cinereus*, gills grey uniform not reaching the stem, pileus grey streaked, centre brown, stipes white tapering upwards. *With. p.* 288. *A. fimetarius*, *Lightf. p.* 1021.

Hab. Dunghills, banks of ditches, gardens, &c., especially after rains. Autumn, frequent, *Lightf.*

39. A. *campanulatus*, gills pale grey uniform, pileus mouse coloured grey conical blunt, stipes grey smooth. *With. p.* 289. *Lightf. p.* 1022.

Hab. Woods, pastures, and rotten leaves. Autumn. *Lightf.*

40. A. *semiovatus*, gills brown grey to black 2—4 in a set, pileus light brown smooth half egg-shaped, stipes cylindrical white. *With. p.* 290. *Sow. t.* 131.

Hab. Cow-pastures and on dunghills, frequent. June—Sept. *Hopk.*

41. A. *plicatilis*, gills grey, in pairs, pileus ash-coloured, centre brownish yellow, stipes white. *With. p.* 291. *Curt. Fl. Lond. with a fig.* *Sow. t.* 364.

Hab. Pastures and new mown grass fields, during the summer and autumn, frequent, *Hopk.*

** *Stipes lateral.*

† *Gills brown.*

42. A. *flabelliformis*, gills yellowish brown numerous, pileus smooth mealy whitish, stipes short variably excentrical. *With. p.* 296. *A. semipetiolaris*, *Lightf. p.* 1030. *Schæff. t.* 208. *Sow. t.* 109.

Hab. On the trunks of fallen trees and decayed timber, frequent. Autumn. *Lightf.*, *Hopk.*

†† *Gills buff.*

43. A. *betulinus*, gills reddish yellow or reddish brown nume-

rous thin very much branched, pileus pale brownish buff cottony irregularly semicircular. *With. p.* 299.

HAB. Stumps of trees during most of the year. Stumps of trees on the banks of the Clyde at Bogleshole, plentifully, *Hopk.*

44. A. *alneus,* gills brownish buff in pairs, pileus gently convex semicircular velvety brownish grey. *With. p.* 300. *Lightf. p.* 1029. *Sow. t.* 183.

HAB. On the trunks of trees and dead wood. Autumn and spring. *Lightf.*

25. MERULIUS. *Withering.*

Volva none. *Pileus* with *gills* or *veins* beneath of the same substance with the rest of the plant.

* *With a stipes and gills beneath.*

1. M. *umbelliferus,* gills white broad at the base 2—4 in a set, pileus white convex a little bossed elegantly plaited at the sides, stipes white slender. *With. p.* 144. *Agaricus umbel., Lightf. p.* 1026.

HAB. On rotten leaves, in woods and shady places. Autumn. *Lightf.*

2. M. *androsaceus,* gills white decurrent, pileus white convex the centre depressed, stipes red brown shining. *With. p.* 145. *Ag. androsaceus, Lightf. p.* 1027. *Sow. t.* 94.

HAB. On old sticks, rotten leaves and mosses. Autumn. *Lightf.*

3. M. *collariatus,* gills white uniform fixed to a collar surrounding the stem, pileus white thin umbonate, stipes white above black below. *With. p.* 146. *Agaricus rotula, Pers. p.* 467. *Sow. t.* 95.

HAB. On sticks in woods, frequent. August. *Hopk.*

4. M. *cantharellus,* stem solid often compressed, gills decurrent branched and anastomosing. *With. p.* 147. *Agaricus canth., Sow. t.* 46. *Lightf. p.* 1008.

HAB. Woods, frequent; especially those of fir, *Lightf., Hopk.* July—September.

Of a yellow colour, an agreeable smell, and much eaten in some countries.

5. M. *Squamula,* stipes bristle-shaped, pileus whitish slightly convex, gills with a few plaits. *With. p.* 149. *Agaricus Squamula, Sow. t.* 93.

HAB. On decayed leaves in Bothwell wood. August. *Hopk.*

** *With a stipes, &c., and with veins beneath.*

6. M. *infundibuliformis,* stipes funnel-shaped hollow expanding at the top like a hollow pileus, gill-like veins branched silvery grey. *With. p.* 150. *Merulius cornucopioides, Pers. p.* 491. *Peziza cornucopioides, Lightf. p.* 1050. *Sow. t.* 74.

HAB. In woods, not unfrequent, *Lightf.* October.

*** *Without a stipes, with deep anastomosing broad veins beneath.*

7. M. *lachrymans,* spreading large orange-coloured with the

margin white and downy, veins forming as it were large pores. *Merulius destruens*, *Pers. p.* 496. *Boletus lachrymans*, *With. p.* 321. *Sow. t.* 113.

Hab. On decayed wood, in cellars and outhouses, and sometimes on posts exposed to the weather. On the wood of churches and houses, *Hopk.*

The pores contain water. This is the *dry-rot*, from which buildings of all kinds, especially ships, have suffered so much. Mr. Sowerby recommends ventilation and avoiding to build in damp situations as the best way to guard against it.

B. Boletoidei. *Membrane or receptacle of the fructification forming tubes, oblong and compressed or rounded, sometimes prominent.*

26. DÆDALEA.

Pileus (dimidiate) between coriaceous and corky, reticulated with subporiform or oblong apertures beneath. (Intermediate between *Merulius* and *Boletus.*)

1. D. *quercina*, coriaceous pale brownish, pileus slightly wrinkled glabrous, apertures large, their interstices branched and sinuated. *Pers. p.* 500. *Agaricus quercinus*, *Lightf. p.* 1028. *Sow. t.* 181.

Hab. Trunks of various trees and decayed wood, frequent, all the year round, *Lightf.*, *Hopk.*

27. BOLETUS.

Pileus varying in its form. *Tubes* and *pores* rounded, entire, separated.

A. *Pileus with the tubes beneath distinct from one another* (*Fistulina Bull.* and *With.*).

1. B. *hepaticus*, fleshy red dimidiate, tubes slender unequal free yellowish. *Pers. p.* 302. *Sow. t.* 56. *Lightf. p.* 1034. *Fistulina hepatica*, *With. p.* 302.

Hab. On the trunks of hollow trees. Aug., Sept. *Lightf.*

B. *Pileus with the tubes united.*

* *Stipes central*[a].

2. B. *aurantiacus*, tubes whitish, pileus red orange, stipes whitish rough. *With. p.* 305. *Sow. t.* 110. *B. aurantius*, *Pers. p.* 504.

Hab. Woods, occasionally. June, July. Bothwell wood, and frequent in a small wood near Carmyle, Glasg., *Hopk.*

3. B. *bovinus*, tubes pale yellowish brown unequal in length, pileus brown or olive clammy, stipes thick pale brown with rusty stains. *With. p.* 306. *Bol. scaber*, *Sow. t.* 175.

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[a] In this genus likewise I follow Withering's characters and names, with few exceptions.

HAB. Woods and pastures, frequent, *Lightf.*, *Hopk.* Autumn.

4. B. *luteus*, tubes deep yellow, pileus deep bay striated, stipes dirty white, ring permanent. *With. p.* 312. *Sow. t.* 265. *B. cortinatus*, *Pers. p.* 503.

HAB. Woods, and sometimes in pastures. In Carmyle and Bothwell woods. Woods, Dougalston; near Glasg. Autumn, plentiful. *Hopk.*

** *Stipes lateral.*

5. B. *lucidus*, tubes white, pileus chesnut coloured shining, stipes hard uneven chesnut coloured shining. *Sow. t.* 134. *B. rugosus*, *With. p.* 315.

HAB. Stumps of trees, rare. Woods, Bothwell. July—Sept. *Hopk.*

6. B. *squamosus*, tubes yellow white, pores large angular, pileus pale buff pencilled with feather-like scales. *With. p.* 316. *Sow. t.* 266. *B. cellulosus*, *Lightf. p.* 1032.

HAB. Stumps of trees, frequent. June—Sept. *Lightf.*, *Hopk.*

The stipes varies much in length, is sometimes branched, and instead of terminating with a *pileus* is acuminated. This state of it is the *B. rangiferinus*, *With.*—A plant of this species, Mr. Hopkirk tells us, has regularly made its appearance for several years past, on the stump of an ash, at Dalbeth, near Glasgow. In 1810 it attained an extraordinary size, being seven feet five inches in circumference, and weighing, after having been cut four days, thirty-four pounds avoird. It was only four weeks in attaining the above size, gaining thus an acquisition of weight, of above one pound three ounces in the day.

7. B. *lateralis*, tubes yellow very short, pileus dead yellow thin smooth, stem yellow. *With. p.* 318. *B. nummularius*, *Sow. t.* 89.

HAB. On the trunks of trees, but not common. Aug., Sept. *Hopk.* At Woodside, *Ure.*

*** *Destitute of stipes.*

8. B. *salicinus*, tubes white to tawny very short, pileus semicircular whitish smooth thin soft leathery. *With. p.* 319. *Sow. t.* 227. *B. albus*, *Lightf. p.* 1037.

HAB. Trunks of old willows, in a wood near Laswade, *Dr. Parsons.*

9. B. *suberosus*, tubes white pointed, pores irregular, pileus white convex smooth thin. *With. p.* 318. *Sow. t.* 288. *Lightf. p.* 1031.

HAB. Trunks of hollow trees. Autumn. *Lightf.*

10. B. *spongiosus*, pores whitish fringed angular, pileus brown woolly. *With. p.* 1033. *Lightf. p.* 1033. *B. velutinus?* *Sow. t.* 345.

HAB. On the trunks of trees. July. *Lightf.*

11. B. *versicolor*, tubes white, pileus striped with different colours. *With. t.* 321. *Sow. t.* 229. *Lightf. p.* 1036.

D. GYMNODERMI. *Pileus varying in form, generally dimidiate, spreading, stemless, dry and coriaceous. Receptacle or membrane of the fructification smoothish or papillose.*

29. THELEPHORA.

Pileus coriaceous, papillose, rarely with minute bristles, or uniform and smooth.

1. Th. *caryophyllea*, somewhat imbricated purplish brown, pileus somewhat funnel-shaped with shaggy concentric lines very shaggy at the margin. *Decand. Fl. Gall. p.* 21. *Auricularia caryophyllea, Sow. t.* 213. *Helvella caryoph., With. p.* 332.

HAB. Wood and stumps of trees, near the ground, and on the ground itself. At Castle Campbell. Sept. *Mr. Greville.*

2. Th. *rubiginosa*, imbricated rigid brownish rust colour glabrous on each side, pippillæ scattered rather large. *Pers. p.* 567. *Auricularia ferruginea, Sow. t.* 26. *Auric. nicotiana, With.*

HAB. On old pales and decayed wood, not uncommon. June, July. *Hopk.*

3. Th. *ferruginea*, effuse reflexed ferruginous, pileus thin somewhat downy smoothish (nearly even) hairy beneath. *Pers. p.* 569. *Auricularia tabacina, Sow. t.* 25.

HAB. Branches of decayed trees in the spring, frequent, *Hopk.*

4. Th. *hirsuta, α. vulgaris*, cæspitose coriaceous yellowish with concentric hairy lines glabrous beneath. *Pers. p.* 570. *Auricularia reflexa, Sow. t.* 27.

HAB. Stumps of trees and rotten wood during the spring, not uncommon, *Hopk., Mr. Greville.*

5. Th. *purpurea*, imbricated subgelatinous zoned downy whitish purple beneath. *Pers. p.* 571. *Auricularia corrugata, Sow. t.* 90.

HAB. Rotten wood and stumps of trees during most of the year, frequent, *Hopk.*

E. CLAVÆFORMES. *Fleshy, elongated, uniform, simple, or branched Fungi, with their surface smooth.*

30. CLAVARIA.

Clavate at the extremity, simple or branched, confluent, with the *stipes*, " discharging its *seeds* from the whole surface." *Decand.*

* CORALLOIDEÆ. *Branched.*

1. Cl. *coralloides*, branches crowded very much divided and subdivided unequal. *With. p.* 359. *Sow. t.* 278. *Lightf. p.* 1060.

HAB. Woods and heaths, not uncommon. Autumn. *Lightf., Hopk.* Usually white.

2. Cl. *fastigiata*, yellow, branches crowded very much divided and subdivided of equal height. *With. p.* 360. *Lightf. p.* 1061.

HAB. Woods and pastures. Autumn. *Lightf.*

Withering seems disposed to consider this a mere var. of the last; and I suspect the following is not different.

3. Cl. ***muscoides***, elongated yellow repeatedly branched in a dichotomous manner, branches slender acute. *Pers. p.* 589. *Sow. t.* 157. *Lightf. t.* 1062.

Hab. Woods and heaths among moss. Autumn. *Lightf., Hopk.*

4. Cl. ***cornea***, gregarious small gelatinous viscid orange-coloured simple or branched connate at the base. *Pers. p.* 596. *Sow. t.* 40.

Hab. Tops of the gate-post at Dalbeth, Glasg., *Hopk.* On uprooted fir-trees, about Edinburgh, after the bark has fallen off. Autumn. *Mr. Greville.*

** Simplices. *Unbranched.*

5. Cl. ***pistillaris***, solitary large very much thickened yellowish brown rounded at the extremity. *Pers. p.* 597. *Cl. herculanea, Sow. t.* 277. *Lightf. p.* 1056.

Hab. On the ground amongst rotten leaves, and sometimes on decayed wood. In Dougalston wood. Autumn. *Hopk.*

6. Cl. ***vermiculata***, subcylindrical or compressed simple hollow brittle somewhat acuminated at the point rarely forked at the extremity. *Lightf. p.* 1057, and *p.* 1056 (*Cl. pistillaris*). *Sow. t.* 253.

Hab. Woods and pastures in the autumn, frequent, *Lightf., Hopk.*

31. GEOGLOSSUM.

Club-shaped; extremity fleshy, generally compressed (short), with the margin prominent, contiguous with the *stipes.*

1. G. ***hirsutum***, subfasciculated hairy black. *Pers. p.* 608.

β. ***capitatum***, scattered downy black capitate. *Clavaria ophioglossoides, Sow. t.* 83.

Hab. Moist heaths and woods occasionally, seldom found with more than one head. Autumn. *Hopk.*

2. G. ***mitrata***, undivided subfasciculated green, pileus rugose obtuse, stipes squamulose. *Clavaria mitrata, Holmsk. Fungi Dan. p.* 24. *t.* 9. *Dicks. Plant. Crypt. Geoglossum viride, Pers. p.* 611.

Hab. Woods in Scotland, near Loch-Lomond, *Dicks.*

F. Helvelloidei. *With a variously-formed, smooth, distinct pileus.*

32. SPATHULARIA.

Club-shaped. *Pileus* compressed, membranaceous on each side, and decurrent with the *stipes.*

1. Sp. ***flavida***. *Pers. p.* 611. *Clavaria spathulata, Sow. t.* 35.

Hab. Woods, rare. Dougalston wood. Autumn. *Hopk.*

33. LEOTIA.

Capituliform. *Pileus* conical or orbicular, with its margins reflexed, closely embracing the *stipes.*

1. L. ***epiphylla***, stipes pale yellow, pileus subclavate obtuse hollow dull orange. *Clavaria epiphylla, Dicks. Pl. Crypt.*

fasc. 3. *p.* 22. *t.* 9. *f.* 10. *Sow. t.* 293. *Leotia Dicksoni, Dicks. p.* 612.

Hab. On decayed leaves in damp situations. Abundant by the roadside on the western shores of Loch-Lomond.

34. HELVELLA.

Pileus membranaceous, inflated, irregular, bent down on each side.

1. H. *Mitra*, large, pileus inflated (free?) pale livid colour, stipes furrowed and lacunose whitish. *Pers. p.* 615. *Sow. t.* 39.

Hab. Woods, not unfrequent in the autumn, *Lightf.* Rare about Glasg. Wood near Castlemilk, *Ure.* Dougalston, *Hopk.*

2. H. *fuliginosa*, greyish free subinflated, stipes long attenuated smooth hollow. *Schæff. t.* 320. *Dicks. Pl. Crypt. fasc.* 3. *p.* 25. *Sow. t.* 454.

Hab. Woods, *Dickson.*

3. H. *aurea*, stipes short yellow, pileus umbrella-like gold-coloured. *With. p.* 334.

Hab. On sticks and stumps of trees in woods and moist places, frequent, *Hopk.*

35. MORCHELLA.

Pileus elongate, rounded, pitted with holes. (*Volva and gelatinous seminal mass none.*)

1. M. *esculenta*, pileus contracted at the base, stipes solid. *Pers. p.* 618. *Helvella esculenta, Sow. t.* 51.

Hab. Woods in the spring, not unfrequent, as at Blair in Athol, in the woods at Langholm in Eskdale, and in Logton wood, near Dalkeith, *Lightf.*

Esculent *Morel:* Much used for seasoning dishes.

36. TREMELLA.

Spreading, gelatinous, variously folded and lobed. "*Seeds* scattered throughout the whole surface." *Decand.*

1. Tr. *albida*, sessile dilated obtuse whitish or somewhat brownish pulpy semipellucid. *Sm. in E. B. t.* 2117. *Tremella candida? Pers. p.* 624.

Hab. On rotten branches of trees, and on pales. On rotten wood at Dalbeth, *Hopk.*

2. Tr. *arborea*, sessile gelatinous roundish undulated blackish beset with mammillary white-headed processes on the upper side. *Sm. in E. B. t.* 2448.

Hab. On fallen trees and on dead wood, frequent. Found on the trunk of a dead tree in Carmyle wood for several years past, about February, *Hopk.*

Dillenius says that this is called, in Herefordshire, Witches' Butter, because, when thrown into the fire, it is believed to be efficacious against witchcraft.

3. Tr. *sarcoides,* sessile gelatinous reddish purple at first club-shaped then rounded lobed plaited or curled finally blackish. *Sm. in E. B. t.* 2450.

HAB. On rotten wood in damp shady places, rare. On the stump of a tree near the pond, Dalbeth, *Hopk.*

Mr. Hopkirk has preserved specimens of this plant in spirits of wine for four years, without the least change in its appearance.

4. Tr. *Sabinæ,* sessile prominent oblong tooth-shaped tawny somewhat powdery. *Sm. in E. B. t.* 710.

HAB. On living plants of the *Juniperus Sabina* and *communis.* May. *Hopk.*

From Mr. Hopkirk's remarks that "on examining this plant with a good microscope, it seemed to consist of a mass of fibres running irregularly across each other, interspersed with many opaque globular bodies, probably the seed," I suspect it will prove to belong to a rather higher order of vegetables, and to be of the genus *Nostoc.*

5. Tr. *mesenterica,* sessile clustered plaited lobed waved orange-coloured. *Sm. in E. B. t.* 709.

HAB. On dead wood occasionally. *Hopk.*

6. Tr. *ferruginea,* sessile clustered lobed waved of a rusty brown the surface finely pubescent. *Sm. in E. B. t.* 1452.

HAB. On dead wood, rare. Found on the pales before the baths, Helensburgh. October. *Hopk.*

7. Tr. *intumescens,* sessile clustered twisted tumid brown shining and gelatinous, when dry thin and membranous. *Sm. in E. B. t.* 1870.

HAB. On the roots of beech trees at Carmyle, *Hopk.*

8. Tr. *Auricula,* sessile leathery reddish brown rough beneath rugged and plaited above resembling an ear. *Sm. in E. B. t.* 2447. *Peziza Auricula, With. p.* 344. *Lightf. t.* 1054.

HAB. Upon the bark of old decayed trees, particularly upon the Elder, *Lightf.* Rotten tree at Dalbeth, Glasgow, *Hopk.*

Mr. Hopkirk's plant was of a dark red colour.

9. Tr.? *cruenta,* minutely granulated diffuse indeterminate shining dark purple. *Sm. in E. B. t.* 1800.

HAB. About the bottom of walls in damp situations in winter, North side of St. George's Church, Glasgow, *Hopk.*

37. PEZIZA.

Receptacle hemisphærical, concave, slightly tumid, bearing the *seed* in the smooth disk, and dispersed in the form of an extremely fine dust.

A. TREMELLOIDEÆ. *Substance more or less gelatinous.*

1. P. *inquinans,* gregarious large blackish and staining when touched at length convex obconical rugose and brownish externally. *Pers. p.* 631. *P. polymorpha, Sow. t.* 428. *Lightf. p.* 631.

HAB. Trunks of trees in November, *Lightf.*

B. HELVELLOIDEÆ. *Large, carnoso-membranaceous, fragile, externally subfarinaceous.*

2. P. *aurantia*, stemless cæspitose subflexuose reddish orange, externally whitish. *Pers. p.* 638. *P. coccinea, Sow. t.* 78 *P. cyathoides, Lightf. p.* 1052.

HAB. Rotten sticks and sometimes upon the ground, on ditch banks in shady places. Spring and autumn. *Lightf., Hopk.*

3. P. *vesiculosa*, cæspitose large olive brown somewhat connivent at the mouth at length campanulate torn at the margin, exterior coat separating from the inner one. *Pers. p.* 641. *Sow. t.* 4.

HAB. On the ground on road sides, and on dunghills, during the spring and autumn, but not common, *Hopk.*

C. *Mostly small, externally hairy or pubescent.*

4. P. *scutellata*, rather large flattened orange-coloured, externally furnished with divergent black hairs. *Pers. p.* 650. *Sow. p.* 24. *Lightf. p.* 1053.

HAB. On rotten wood and old cow dung, in spring and autumn, *Lightf.*; and often on the ground in hot-beds, and in flower-pots, common, *Hopk.*

5. P. *pulchella*, scattered subsessile hairy white, disk orange red. *Pers. p.* 653. *P. bicolor, Sow. t.* 17.

6. P. *virginea*, gregarious white upon rather a long stipes hemisphærical patulous hairy. *Pers. p.* 653. *P. nivea, Sow. t.* 65.

HAB. On rotten wood and decayed trees, frequent. Autumn. *Hopk.*

D. *Entirely glabrous, at least not manifestly downy, carnoso-cereaceous (mostly minute).*

7. P. *Prunastri*, breaking through the epidermis scattered sessile coriaceous black paler beneath. *Pers. p.* 673.

HAB. On the dead stems of *Prunus Cerasus, Mr. Greville.*

38. ASCOBOLUS.

Receptacle hemisphærical, fleshy. *Capsules* (*thecæ*) manifest, protruding, filled with a fluid, and generally three *seeds* or *sporules*.

1. A. *furfuraceus*, gregarious somewhat concave brown or greenish, externally furfuraceous. *Pers. p.* 676. *Peziza stercoraria, Sow. t.* 18.

HAB. On cow dung, about Edinburgh. Autumn. *Mr. Greville.*

SECT. II. NÆMATOTHECII. *Filamentous Fungi.*

39. MONILIA.

Stipitate, or spreading. *Filaments* moniliform or articulated.

* *Stipitate. Filaments forming a rounded head.*

1. M. *glauca*, tufted cinereo-glaucous. *Pers. p.* 691. *Mucor*

glaucus, *Lightf. p.* 1072. *Sow. t.* 378. *f.* 9. *f.* 14. *M. lignifragus.*

Hab. On decayed fruit and vegetables, &c., common, *Lightf.*, *Hopk.* This is the well known *blue mould.*

*** Caulescent. Filaments moniliform, straight, digitate.*

2. M. *digitata*, glaucous, stipes simple digitate. *Pers. p.* 693. *Mucor crustaceus*, *Lightf. p.* 1073.

Hab. On corrupted fruit of various kinds, frequent, *Lightf.*

40. DEMATIUM.

Filaments of an indeterminate form, erect or depressed, somewhat fasciculate or spreading, smooth and not interwoven.

1. D. *epiphyllum*, erect fasciculate subolivaceous at length pulveraceous, filaments smooth. *Pers. p.* 695.

Hab. On the under surface of the dead leaves of *Pinus Picea*, *Mr. Greville.*

2. D. *strigosum*, tufted tawny filaments somewhat rigid divergent. *Pers. p.* 695. *Byssus fulva*, *Lightf. p.* 1002. *B. barbata*, *E. B. t.* 701.

Hab. Upon wet half decayed wood lying in shady places, in autumn and winter, *Lightf.*

3. D. *violaceum*, dense spreading violet-coloured. *Pers. p.* 697. *Byssus phosphorea*, *Lightf .p.* 1000. *Auricularia phosphorea*, *Sow. t.* 350. *Conferva phosph.*, *Dillw. Conf. t.* 88.

Hab. On the bark of decayed wood and sticks, in the autumn and winter, frequent, *Lightf.*

Almost forms a membrane, and hence Sowerby has made it an *Auricularia.*

41. ERINEUM.

Epiphyllous. *Filaments* rigid, collected into a subcupuliform tuft impressed upon the leaves.

1. E. *acerinum*, depressed broadish reddish brown. *Pers. p.* 700.

Hab. On the leaves of *Acer pseudo-Platanus*, about Edinburgh. *Mr. Greville.*

2. E. *alneum*, tufted dense almost scarlet. *Pers. p.* 701.

Hab. On the leaves of *Betula alba* on the upper surface, *Mr. Greville.*

3. E. *betulinum*, tufted dense ferruginous. *Decand. Fl. Gall. p.* 15.

Hab. On the under surface of the leaves of *Betula alba*, about Edinburgh. Autumn. *Mr. Greville.*

42. RACODIUM.

Expanded, soft, with the filaments densely interwoven.

1. R. *cellare*, broadly spreading very soft greenish black. *Pers. p.* 701. *Nees von Esenbeck*, *t.* 5. *f.* 70. *Byssus septica*, *Lightf. p.* 999. *Fibrillaria vinaria*, *Sow. p.* 432.

Hab. Wine-vaults, upon the casks and walls, frequent, *Lightf.*

43. HIMANTIA.

Creeping, hairy, with branching fibres.

1. H. *candida*, epiphyllous delicate white somewhat feathery and dilated at the extremity. *Pers. p.* 704. *Nees von Esenbeck, t.* 5. *f.* 72. *Byssus candida, Lightf. p.* 1003. *Fibrillaria stellata, Sow. t.* 387. *f.* 1.

Hab. On rotten leaves and damp decaying wood, in autumn and winter, *Lightf.*

Order II. LICHENS. *Ach.*

(Lichenes, *Ach. Lichenes, and part of Hypoxyla, Decand. Part of Algæ, Juss. Genus Lichen, and some Byssi, Linn.*)

Universal recept. (*thallus, crust* or *frond,*) polymorphous, without roots, perennial, abounding in excessively minute bodies for the purposes of propagation, either imbedded in the substance or scattered upon its surface, or included in peculiar organs, which have been considered the *fruit* (partial receptacles, or *apothecia*, by some called *shields*, or *scutella*, and *tubercles*). *Ach.*

Vegetation.—The *Lichens* bear a closer affinity to the *Fungi* than to any other order. Sometimes they are formed of a simple, pulverulent crust or frond, sometimes membranous, coriaceous, gelatinous, lobed, and variously branched; at all times destitute of leaves. They present various colours, not unfrequently tending to green.

Div. I. Idiothalami. *Lichens whose Apothecia are formed of a substance distinct from the Thallus, and different from it in colour.*

Sect. I. Homogenei. *Apothecia simple, entirely formed of a nearly uniform pulverulent or cartilaginous substance.*

A. *Apothecia destitute of a raised margin.*

1. SPILOMA.

Universal receptacle crustaceous, spreading, plane, adnate, uniform. *Partial recept.* composed of minute granules collected into a compact, homogeneous, subpulverulent, naked, variously shaped, coloured mass.

1. S. *tumidulum*, crust somewhat cartilaginous whitish, apothecia crowded tumid oblong varying in figure roughish reddish at length brownish black and somewhat pruinose. *Ach. Syn. Lich.*[*] *p.* 1. *E. B. t.* 2151.

Hab. On the bark of trees, occasionally, *Hopk.*

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[*] "*Acharii Synopsis Methodica Lichenum*," whose arrangement and characters are here, with few exceptions, adopted.

2. ARTHONIA.

Universal receptacle crustaceous, spreading, plane, adnate, uniform. *Partial recept.* sessile and subimmersed, roundish, but varying in form, destitute of margin (black), covered with a subcartilaginous membrane.

1. A. *astroidea*, crust membranaceous pale cinereous and glaucescent, apothecia flattened upon the crust plane angular substellate black. *Ach. Syn. Lich. p.* 6. *Opegrapha astroidea, E. B. t.* 1847.

Hab. On the smooth bark of trees, common, *Hopk.*

3. SOLORINA.

Universal receptacle foliaceous, coriaceous, lobed, free, beneath having fibrous or woolly veins. *Partial recept.* adnate, rounded, destitute of margin, covered by a coloured membrane.

1. S. *crocea*, thallus greenish (brown when dry) lobed, beneath veiny and of a fine saffron colour, apothecia somewhat tumid brown. *Ach. Syn. Lich. p.* 8. *Lichen croceus, Lightf. p.* 856. *E. B. t.* 498.

Hab. Tops of the Highland mountains, not uncommon, especially in a micaceous soil, Ben Lomond, &c.

Remarkable for the brilliant orange or saffron colour of the underside. Habit of a *Peltidea*, near which it would much more naturally range.

2. S. *saccata*, thallus lobed greyish green whiter and fibrous beneath, apothecia at length sunk into deep pits or hollows brown. *Ach. Syn. Lich. p.* 8. *Lichen saccatus, Lightf. p.* 855. *E. B. t.* 288.

Hab. Upon the earth in the chasms of the rocks that are damp and shady, not unfrequent, especially in the Highlands, *Lightf.*

B. *Apothecia with a raised border or margin.*

4. LECIDEA.

Universal receptacle various, crustaceous, spreading, adnate, uniform or foliaceous. *Partial recept.* scutelliform, sessile, surrounded by a cartilaginous membrane, having a disk of a similar nature with the raised border or margin.

* *Thallus crustaceous, uniform (Catillaria).*

† *Apothecia constantly black, naked (not pruinose).*

1. L. *coracina*, crust continued tessellated greyish black, apothecia immersed between the areolæ plane at length convex somewhat angular black of the same colour within. *Ach. Syn. Lich. p.* 11. *Lichen atratus, E. B. t.* 2335.

Hab. Granite rocks at the head of Loch Lee, in Glen Esk, Angus-shire, rare, *G. Don.*

2. L. *atro-alba*, crust spreading very thin cracked black with swelling whitish scattered areolæ, apothecia plane or slightly convex often in the interstices black of the same colour within. *Ach. Syn. Lich. p.* 11.

Hab. Upon rocks, *Lightf.*

3. L. *fusco-atra*, crust very thin black cracked and tessellated, areolæ chesnut brown plane marginated shining scattered, apothecia rather convex black margined white within. *Ach. Syn. Lich. p.* 12. *Patellaria fusco-atra, Hoffm. Pl. Lich. t.* 54. *f.* 1. *Lichen fusco-ater, Lightf. p.* 804. *Lichen dendriticus, E. B. t.* 1734.

Hab. Rocks, *Lightf.* Pentland Hills, *Dr. Walker.* Ben Lomond, *Mr. Turner.*

Margin of the crust sometimes fimbriated, where it becomes the *Verrucaria dendritica, Hoffm. Pl. Lich. t.* 19. *f.* 4.

4. L. *fumosa*, crust subcartilaginous tessellated smoothish brownish grey, apothecia buried in the crust plane margined at length convex clustered and losingt heir margin black, within greyish black. *Ach. Syn. Lich. p.* 12. *Lichen gibbosus, Dicks. Pl. Crypt. fasc.* 2. *t.* 6. *f.* 5. *Lichen cechumenus, E. B. t.* 1830, and *L. athrocarpus, E. B. t.* 1829.

Hab. Alpine rocks, upon the summit of Ben Lawers, *Dickson.*

5. L. *confluens*, crust tartareous somewhat spreading tessellated nearly even greyish brown, apothecia sessile at length irregular convex subglobose confluent black immarginate, within having a thin greyish stratum beneath the disk. *Ach. Syn. Lich. p.* 16. *E. B. t.* 1964.

Hab. Rocks on the Pentland Hills, *Sir Jas. E. Smith.* On the Cathkin Hills, near Glasgow, *Hopk.* On the ascent, south side, and summit, of Ben Lomond, *Mr. Turner* and *Hook.*

6. L. *parasema*, crust thin submembranaceous greyish white bordered with black at length spreading somewhat granulated, apothecia nearly plane sessile margined black blackish within. *Ach. Syn. Lich. p.* 17. *Lichen parasemus, E. B. t.* 1450. *L. sanguinarius, Lightf. p.* 803.

Hab. On the bark of trees, frequent, *Lightf.*, *Hopk.*

7. L. *sanguinaria*, crust rugose and warted greyish white, apothecia at length convex hemisphærical somewhat tuberculated black horny and black within having beneath a powdery bright red stratum. *Ach. Syn. Lich. p.* 19. *Lichen sanguinarius, E. B. t.* 155.

Hab. On rocks, *Lightf.*, who has confounded it with *L. parasema.*

8. L. *atro-virens*, crust spreading thin black scattered with planish subcontiguous bright yellow areolæ, apothecia plane or slightly concave black of the same colour within. *Ach. Syn. Lich. p.* 21. *Verrucaria atro-virens, Hoffm. Pl. Lich. t.* 17. *f.* 4.

β. *geographica*, areolæ bright yellow plane angular black between and with a black margin. *Lichen geographicus, E. B. t.* 248.

Hab. α. Upon rocks about New Posso and other places, *Lightf.* β. On rocks frequent.

9. L. *silacea*, crust tartareous tessellated yellowish red, apothecia

sessile plane at length convex irregular confluent black internally corneous and black. *Ach. Syn. Lich. p.* 22. *E. B. t.* 1118 (*Lichen silaceus*).

Hab. Rocks on Ben Nevis, *Mr. Turner* and *Hook.*

10. L. *Œderi*, crust granulated and tessellated somewhat pulverulent ochraceous red, apothecia minute elevated with the margin tumid, the disk depressed black nearly of the same colour internally. *Ach. Syn. Lich. p.* 22. *E. B. t.* 1117 (*Lichen Œd.*).

Hab. Rocks in Scotland, *Dickson.* On Ben Nevis, *Mr. Turner* and *Hook.*

11. L. *alba*, crust membranaceous white with a greyish or whitish grey powdery substance scattered over it in small clusters, apothecia minute appressed plane black. *Ach. Syn. Lich. p.* 24. *Lepraria alba, E. B. t.* 1349. *Byssus lactea, Lightf. p.* 1007.

Hab. On the bark of old trees and rocks, common.

I have never seen the *apothecia*, described by Acharius, on this species.

†† *Apothecia black with a grey bloom.*

12. L. *albo-cærulescens*, crust tartareous contiguous even at length somewhat tessellated and whitish, apothecia sessile and elevated plane black with a grey bloom and a black smooth border. *Ach. Syn. Lich. p.* 30. *E. B. t.* 2224 (*Lichen pruinosus*).

Hab. Scotch Alps, *Dickson.*

13. L. *epipolia*, crust tartareous defined tessellated white, areolæ swelling, apothecia sessile hemisphærical with a grey bloom black within with a thin persistent margin. *Ach. Syn. Lich. p.* 32. *E. B. t.* 1137 (*Lichen epip.*).

Hab. Scotch Alps, *Dickson.*

††† *Apothecia orange, red, flesh-colour, or more or less brown.*

14. L. *incana*, crust spreading leproso-farinose soft uneven glaucous green, apothecia scattered sessile brown with the margin entire paler. *Ach. Syn. Lich. p.* 36. *E. B. t.* 1685 (*Lichen incanus*). *Byssus incana, Lightf. p.* 1006.

Hab. Woods, trunks of trees, and amongst moss, frequent. *Lightf., Hopk.*

The *apothecia*, which are published no where but in *Engl. Bot.*, are of extremely rare occurrence, and, till their discovery, the plant was arranged among the *Lepraria* by Acharius.

15. L. *sulphurea*, crust tartareous cracked and broken uneven smoothish pale sulphur colour, apothecia adnate plane scarcely margined brown and scarcely paler in the margin at length irregular and convex. *Ach. Syn. Lich. p.* 37. *E. B. t.* 1186 (*Lichen sulph.*).

Hab. Rocks in Scotland, *Dickson.* On Ben Lomond, *Mr. Turner* and *Hook.* Walls and rocks about Helensburgh, *Hopk.*

16. L. *decolorans,* crust granulated greyish white, granules becoming pulverulent, apothecia nearly plane red flesh-coloured livid or brown with the elevated margin paler at length flexuose. *Ach. Syn. Lich. p.* 37.

β. *granulosa,* crust firmer granulated and subpapillose, apothecia at length hemisphærical rugose brownish-black and black confluent. *Ach. Lichen escharoides, E. B. t.* 1247, and *Lichen quadricolor, E. B. t.* 1185.

Hab. On the ground by the side of Loch Lomond, *Mr. Turner* and *Hook.*

17. L. *rupestris,* crust thin tartareous contiguous greyish white, apothecia immersed plane margined at length convex the margin persistent glabrous reddish brown of the same colour within. *Ach. Syn. Lich. p.*39. *Lichen rupestris, E. B. t.*2245. *Lichen calvus, E. B. t.* 948.

Hab. Upon rocks in the subalpine parts of Scotland, *Dickson.*

18. L. *luteola,* crust thin whitish covered with somewhat globular pale granules at length greyish, apothecia sessile becoming convex yellowish brown. *Ach. Syn. Lich. p.* 41. *Lichen vernalis, Lightf. p.* 805. *E. B. t.* 845.

Hab. On the bark of trees, *Lightf.*

19. L. *fusco-lutea,* crust spreading very thin membranaceous white or greyish somewhat shining subgranulose, apothecia plane yellow-brown at length red-brown with the margin paler elevated at length flexuose. *Ach. Syn. Lich. p.* 42. *Lichen fusco-luteus, E. B. t.* 1007.

Hab. Highland mountains, plentiful. On low ground in Orkney, as in the isle of Eda, covering grass, moss, &c.

20. L. *anthracina,* crust spreading somewhat scaly uneven roughish darkish brown, apothecia minute plane reddish-yellow with the margin paler at length somewhat convex and brownish. *Achar. Syn. Lich. p.* 43. *Lichen byssinus, E. B. t.* 432.

Hab. On rocks and on trees, Scotland, *Dickson.*

21. L. *cæsio-rufa,* crust tessellated rugose darkish grey, apothecia plane rusty orange the margin sometimes crenulate at length convex with the margin obsolete blackish red. *Ach. Syn. Lich. p.* 44. *Lichen ferrugineus, E. B. t.* 1650.

Hab. Rocks on Ben Nevis and Ben Lomond, *Mr. Turner* and *Hook.* Rocks and trees, frequent, *Hopk.*

22. L. *icmadophila,* crust leprose uneven somewhat granulated greenish white, apothecia nearly sessile plane flesh-coloured at length waved roughish in the disk margin scarcely any. *Ach. Syn. Lich. p.* 45. *Lichen ericetorum β, Lightf. p.* 809. *L. ericetorum, E. B. t.* 372.

Hab. Upon the ground in heaths, sides of peat-bogs, gravel-pits, and on banks, *Lightf. p.* 809.

23. L. *marmorea*, crust thin greyish white, apothecia somewhat globose at length urceolate white, the disk flesh-coloured, the margin tumid entire. *Ach. Syn. Lich. p.* 46. *E. B. t.* 739 (*Lichen marm.*).

HAB. Upon the bark of trees, on earth and mosses, *Dickson.*

24. L. *alabastrina*, crust thin smoothish minutely granulated greyish white, apothecia slightly convex entire whitish rose-colour paler at the margin. *Ach. Syn. Lich. p.* 46. *Lichen rosellus, E. B. t.* 1651.

HAB. Received from Scotland by *Mr. Turner, v. E. Bot.*

25. L. *Ehrhartiana*, crust cartilaginous cracked rugoso-plicate granulated white or greenish, apothecia nearly sessile plane at length slightly convex waved unequal clustered pale yellowish. *Ach. Syn. Lich. p.* 47. *Lichen Ehrhartianus, E. B. t.* 1136.

β. *polytropa*, crust subtartareous tessellated pale, apothecia nearly plane with the margin lobed waved clustered at length subglobose destitute of margin yellowish flesh-colour. *Lichen polytropus, E. B. t.* 1264.

HAB. β. Rocks on the Pentland hills, *Maugh.* Rocks about N. Queensferry, and upon Ben Lomond, *Mr. Turner* and *Hook.*

26. L. *lucida*, crust thin leprose powdery soft pale greenish yellow, apothecia slightly convex pale yellowish, margin obsolete. *Ach. Syn. Lich. p.* 48. *Lichen lucidus, E. B. t.* 1550.

HAB. Rocks above N. Queensferry, *Mr. Turner* and *Hook.*

27. L. *luteo-alba*, crust thin smoothish white, apothecia crowded at length convex hemisphærical margined orange coloured white within. *Ach. Syn. Lich. p.* 49. *Lichen aurantiacus, Lightf. p.* 810. *Lichen luteo-albus, E. B. t.* 1426.

** *Thallus crustaceous of some determined figure, or foliaceous (Lepidoma).*

28. L. *vesicularis*, crust somewhat imbricated brownish black covered with a greyish powder, lobes entire swelling, apothecia black naked at length hemisphærical with the margin obsolete. *Ach. Syn. Lich. p.* 51. *Lichen cæruleo-nigricans, Lightf. p.* 805. *E. B. t.* 1139.

HAB. Upon the Highland rocks, but not common, *Lightf.*

29. L. *lurida*, crust imbricated greenish brown, lobes roundish crenate paler beneath, apothecia plane at length somewhat convex black. *Ach. Syn. Lich. p.* 51. *Lichen luridus, E. B. t.* 1329.

HAB. Scotch Alps, *Dickson.*

30. L. *scalaris*, crust imbricated pale olive green, lobes distinct reniform nearly erect beneath and the margin powdery, apothecia plane margined glaucous black. *Ach. Syn. Lich. p.* 52. *Lichen scalaris, E. B. t.* 1501.

HAB. Upon rocks and earth in the Scotch Alps, *Dickson.*

31. L. *decipiens*, crust subimbricated, lobes distant subpeltate roundish flesh-coloured and red brown whitish beneath, apothecia in their border convex and subglobose black, margin obsolete. *Ach. Syn. Lich. p.* 52. *Lichen decipiens, E. B. t.* 1501.

Hab. Upon the earth in heathy places, Scotland, *Dickson.*

32. L. *microphylla*, thallus slightly imbricated fragmentary greyish green on a dense black fibrous cushion, its segments somewhat linear lobed crenate and granular at the margin, apothecia scattered tawny paler at the margin at length convex brown obliterating the margin. *Lichen microphyllus, E. B. t.* 2128. *Lecidea microphylla, var. triptophylla, Ach. Syn. Lich. p.* 53.

Hab. Trees by Loch Katarine, *Mr. Turner* and *Hook.* At Inverary and in Glen Ach-na-shilloch, Ross-shire, *Mr. Borrer* and *Hook.*

5. CALICIUM.

Universal receptacle crustaceous, spreading, plane, adnate, uniform. *Partial recept.* cup-shaped, sessile, or stipitate, cartilaginous, containing a compact pulverulent mass, plane or convex above, forming a naked disk.

1. C. *sphærocephalum*, crust very thin greyish smooth, apothecia subglobose, the disk dark brown, the margin greyish, stipes filiform black. *Ach. Syn. Lich. p.* 57. *Lichen sphæroc., E. B. t.* 414. *Mucor sphærocephalus* and *lichenoides, Lightf. p.* 1071.

Hab. On the bark of old trees and pales.

6. GYROPHORA.

Universal receptacle foliaceous, coriaceo-cartilaginous, peltate, of one piece (or by luxuriance many-leaved), free beneath. *Partial recept.* subscutelliform, sessile, and adnate, covered by a cartilaginous (black) membrane, the *disk* warted or marked with circles, variously plaited and contorted and margined.

1. G. *glabra*, thallus smoothish blackish green beneath smooth black and naked, apothecia at length convex rough and plaited. *Ach. Syn. Lich. p.* 63.

β. *polyphylla*, thallus of many leaves or lobes variously folded blackish green quite black beneath on each side naked and smoothish. *Lichen polyphyllus, Lightf. p.* 863. *E. B. t.* 1282.

Hab. Rocks on the Highland mountains, frequent, *Lightf.*

2. G. *proboscidea*, thallus membranaceous with elevated reticulations at length of a smoky ash-colour rough smoother paler and subfibrillose beneath, apothecia turbinate at length convex variously plaited. *Ach. Syn. Lich. p.* 64. *E. B. t.* 2484. *Lichen deustus, Lightf. p.* 861.

Hab. Highland mountains, on rocks near their summits, common. The *G. arctica, E. B. t.* 2485, is but a var. of this.

3. G. *cylindrica*, thallus somewhat naked dark greenish grey folded and lobed strongly ciliated beneath smooth pale with branching fibres, apothecia elevated nearly plane with concentric and plaited lines. *Ach. Syn. Lich. p.* 65. *Lichen crinitus, Lightf. p.* 522. *Lichen proboscideus*, **E. B. t.** 522.

Hab. Rocks on the Highland mountains, not uncommon.

4. G. *erosa*, thallus rugged olivaceous brown its circumference perforated and laciniated dark grey beneath glabrous somewhat granulated and fibrous, apothecia somewhat convex variously plaited. *Ach. Syn. Lich. p.* 65. *E. B. t.* 2066. *Lichen torrefactus, Lightf. p.* 862.

Hab. Rocks on the Highland mountains, frequent, especially near the summits.

5. G. *deusta*, thallus roughish olivaceous brown with a brown scattered dust smooth beneath with pits and reticulations naked of the same colour, apothecia plane with circular plaits at length convex. *Ach. Syn. Lich. p.* 66. *E. B. t.* 2483.

Hab. Rocks in the Highlands of Scotland, *Dickson, Mr. Turner* and *Hook.*

6. G. *pustulata*, thallus blistered and warty greenish ash-colour beneath deeply pitted smooth palish brown naked, apothecia few plane margined, disk somewhat even papillose and plaited. *Ach. Syn. Lich. p.* 66. *Lichen pust., E. B. t.* 1283. *Lightf. p.* 858.

Hab. Rocks on the Highland mountains, not unfrequent, *Lightf.* The fruit is rare, and has been found by *Mr. Menzies*; and by *Mr. Borrer* and *myself* on rocks in Skye.

7. G. *pellita*, thallus smooth sinuato-lobate of a greenish coppery brown beneath black with dense pulvinate fibres, apothecia sessile at length somewhat globose variously plaited intricate. *Ach. Syn. Lich. p.* 67. *Lichen pellitus, E. B. t.* 931. *L. polyrhizus, Lightf. p.* 864.

Hab. Rocks on the Highland mountains, frequent.

7. OPEGRAPHA.

Universal receptacle crustaceous, spreading, plane, adnate, uniform. *Partial recept.* oblong, elongated, sessile, covered with a cartilaginous black membrane, its disk linear, margined on each side.

1. O. *Persoonii*, crust tartareous smoothish cohering uneven whitish, apothecia innate oblong their disk resembling a cleft, at length rugose waved plaited dissimilar rather confluent with the disk irregular somewhat dehiscent. *Ach. Syn. Lich. p.* 71.

β. *aporea*, crust tartareous or leprose uneven pulverulent, apothecia roundish dissimilar waved plaited tortuose and variously expanded in the disk. *Lichen simplex, E. B. t.* 2152.

HAB. β. On slate and stones, frequent, *Hopk.*

2. O. *vulgata*, crust between cartilaginous and membranaceous somewhat scaly smoothish greenish white, apothecia sessile long or roundish, waved somewhat shining, with the disk very narrow. *Ach. Syn. Lich. p.* 73. *E. B. t.* 1811.

HAB. Bark of trees, common, *Hopk.*

3. O. *macularis*, crust very thin brownish black, apothecia minute much crowded roundish elliptical at length rugose irregular, disk very narrow. *Ach. Syn. Lich. p.* 72. *O. epiphega, t.* 2282.

HAB. On the bark of trees, common, *Hopk.*

Known by the *apothecia* being so closely crowded as to form largish black spots.

SECT. II. HETEROGENII. *Apothecia subsimple, formed of a solitary perithecium* (*or external covering*) *including the fructiferous mass.*

* *Apothecia margined.*

8. GRAPHIS.

Universal receptacle crustaceous, spreading, plane, adnate, uniform. *Partial recept.* elongated, immersed in the *thallus*, which forms a margin on each side the naked linear disk, not covered by a membrane. (However correct this character may be, the genus does not appear, in habit and general external character, at all different from *Opegrapha.*

1. Gr. *scripta*, crust membranaceous smooth somewhat shining white or greyish brown bordered with black, apothecia half immersed naked flexuose simple or branched, disk very narrow, margin formed of the thallus raised membranaceous. *Ach. Syn. Lich. p.* 81. *E. B. t.* 1813 (*Opegrapha scripta*). *Lichen scriptus, Lightf. p.* 800.

HAB. On the smooth bark of trees occasionally, *Lightf.*, *Hopk.*

** *Apothecia without any margin.*

9. VERRUCARIA.

Universal receptacle crustaceous, spreading, plane, adnate, uniform. *Partial recept.* globoso-hemisphærical, its base immersed in the *thallus*, with a double coat; *exterior* subcartilaginous, thick (black), closing the upper half, tipped with a small prominent orifice; *interior* very thin, membranaceous, including a subglobose cellular nucleus.

1. V. *maura*, crust very thin smooth much cracked very black, apothecia very minute subglobose immersed the extremity prominent umbilicated, nucleus blackish. *Ach. Syn. Lich. p.* 95. *E. B. t.* 2456.

HAB. Frequent on rocks on the Scottish coast; as at Losie-mouth, coast of Moray; basaltic rocks at Dunbar, *Mr. Borrer* and *Hook.*

10. ENDOCARPON.

Universal receptacle crustaceous, plane, adnate, of some determined figure, or foliaceous and peltate. *Partial recept.* globose, concealed within the substance of the *thallus*, and surrounded by a simple, thin, diaphanous membrane, with a subpapilliform thick orifice rising just above the *thallus*, and including a *nucleus* of nearly the same substance.

1. E. *tephroides*, thallus crustaceous submembranaceous spreading and subfoliaceous contiguous wavy cracked glaucous ash-colour irregularly lobed and crenated at the margin beneath black somewhat spongy, orifices elevated convex black perforated. *Ach. Syn. Lich. p.* 98. *E. B. t.* 2013 (*Lichen tephr.*), and *t.* 1500 (*Lichen fuscellus*).

HAB. On the ground at Burgh-head, in Stronsa, one of the Orkney islands, *Mr. Borrer* and *Hook.*

2. E. *parasiticum*, thallus coriaceous convex rounded lobed copper coloured at length rugged black and shaggy beneath, orifices scattered sunk minute coal-black at length convex. *Ach. Syn. Lich. p.* 100. *E. B. t.* 1866 (*Lichen parasit.*).

HAB. On *Parmelia omphalodes*, at the foot of Ben Nevis, and upon rocks in the hilly moors of Ross-shire, *Mr. Borrer* and *Hook.*

3. E. *leptophyllum*, thallus cartilaginous foliaceous orbicular peltate brown or greyish the border spread and wavy smooth naked rough and black beneath, orifices of the apothecia very minute slightly prominent black. *Ach. Syn. Lich. p.* 102. *E. B. t.* 2012 (*Lichen leptoph.*).

HAB. Upon rocks on the hill of Kinnoul, near Perth, *Mr. Borrer* and *Hook.*

4. E. *smaragdulum*, thallus crustaceo-cartilaginous somewhat foliaceous minute subpeltate appressed plane roundish entire yellowgreen, orifices of the apothecia depressed reddish brown. *Ach. Syn. Lich. p.* 98. *Lichen smaragd.*, *E. B. t.* 1512.

HAB. Upon rocks near Sheean Ferry, *Mr. Turner* and *Hook.*

5. E. *miniatum*, thallus thick crustaceo-cartilaginous foliaceous orbicular peltate greyish spread at the margin somewhat lobed and waved beneath smooth at length rugose and tawny, orifices minute slightly prominent brownish. *Ach. Syn. Lich. p.* 101. *Lichen miniatus*, *E. B. t.* 593. *Lightf. p.* 857.

HAB. Rocks, frequent; as King's Park, Edinb., *Lightf.* Castle rock, Edinb., *Maugh.*

6. E. *complicatum*, thallus coriaceo-cartilaginous lobed greyish beneath brownish black, the lobes nearly erect rounded plicate and convolute, orifices of the apothecia numerous convex black. *Ach. Syn. Lich. p.* 102. *Lichen miniatus*, *β. amphibius*, *E. B. t.* 593. *f.* 2. *Lichen miniatus*, *β. complicatus*, *Lightf. p.* 858.

Hab. On rocks with the preceding, *Lightf.* Common.

Sir James Smith justly remarks, that this seems to unite the foregoing and the following species.

7. E. *Weberi,* thallus cartilagineo-coriaceous lobed greenish brown olivaceous beneath rather tawny or blackish on both sides smooth, the lobes laciniated waved plaited and crisped crowded, orifices rather convex black. *Ach. Syn. Lich. p.* 103. *Lichen aquaticus, E. B. t.* 594.

Hab. Rocks and stones over which water trickles, within reach of the spray of cascades, &c., not uncommon.

Div. II. Cœnothalami. *Lichens whose apothecia are formed in part from the substance of the crust or thallus.*

Sect. I. Phymatoidei. *Apothecia included in wart-like processes which are formed of the thallus.*

11. PORINA.

Universal receptacle crustaceo-cartilaginous, expanded, plane, adnate, uniform, with wart-like processes. *Partial receptacle* immarginate (1 or more), hid within the substance of the wart, and surrounded by a very thin diaphanous membrane, its orifice thicker coloured, in the surface of the wart, and containing a subglobose cellular *nucleus.*

1. P. *pertusa,* crust smooth even whitish grey, warts of the apothecia subglobose, orifices many depressed black. *Ach. Syn. Lich. p.* 109. *Lichen pertusus, Lightf. p.* 802. *E. B. t.* 677.

Hab. Trunks of trees and sometimes rocks, *Lightf.*

12. THELOTREMA.

Universal receptacle crustaceo-cartilaginous, spreading, plane, adnate, uniform, with wart-like processes, perforated with a wide pore, and margined. *Partial receptacle* solitary, included in the wart, with a double coat; one dimidiate, superior, thick (black), rarely wanting; the other very thin, membranous, sometimes breaking above, inclosing a compressed cellular *nucleus* placed in the bottom of the wart.

1. Th. *lepadinum,* crust smooth whitish, warts of the apothecia smooth somewhat cone-shaped with the margin of the aperture thin simple somewhat inflexed and contracted covered at the bottom with a membrane which bursts. *Ach. Syn. Lich. p.* 115. *Lichen inclusus, E. B. t.* 678.

Hab. On the bark of *Ilex aquifolia,* at Bilston-burn, near Edinb., *Mr. G. Don.*

2. Th. *exanthematicum,* crust subtartareous thin contiguous

greyish, warts of the apothecia convex half immersed whiter, orifices much contracted radiated with fissures concealing the flesh-coloured apothecia. *Ach. Syn. Lich. p.* 116. *Lichen exanthematicus, p.* 1184.

Hab. Calcareous rocks, *Dickson.*

Of this very pretty little Lichen, Acharius observes, that it has a habit peculiar to itself; but that it corresponds better with this genus than with any other.

13. PYRENULA.

Universal receptacle crustaceous, spreading, plane, adnate, uniform; with wart-like processes including or surrounding at the base a solitary, simple, thick (black), papillary *partial receptacle,* which contains a globose cellular *nucleus.*

1. P. *nigrescens,* crust tartareous somewhat tessellated unequal brownish black, warts of the apothecia spreading at the base depressed somewhat rugose surrounding the greater part of the prominent apothecia. *Ach. Syn. Lich. p.* 126. *Verrucaria umbrina, E. B. t.* 1499.

Hab. Rocks, not uncommon, *Mr. Turner* and *Hook.*

14. VARIOLARIA.

Universal receptacle crustaceous, expanded, plane, adnate, uniform. *Partial receptacle* warted, formed of the *thallus* (generally sorediform), somewhat margined (white). *Nucleus* compressed, cellular, concealed within the substance of the warts.

1. V. *amara,* crust rugose cracked uneven subpulverulent white or greyish, warts of the apothecia appressed plano-concave margined bearing soredia of the same colour as the crust. *Ach. Syn. Lich. p.* 131. *Lichen fagineus, Lightf. p.* 807. *E. B. t.* 1713.

β. *discoidea,* crust pulverulent white at length greyish naked, soredia crowded at length spreading waved plano-concave with the margin raised swollen. *Lichen discoideus, E. B. t.* 1714. *L. carpineus, Lightf. p.* 807.

Hab. α. On the bark of beech, oak, and other trees, frequent. β. On the smooth bark of beech and other trees, *Lightf., Hopk.*

Var. α. is highly bitter. Mr. Turner observes, that the bitter flavour is not found in β.

2. V. *lactea,* crust tartareous distinctly bordered cracked smooth white the circumference somewhat zoned crenato-lobate, warts of the apothecia crowded margined very white and pulverulent. *Ach. Syn. Lich. p.* 132. *E. B. t.* 2410.

Hab. On rocks, common. Whin stones, on Campsie and Cathkin hills, *Hopk.*

SECT. II. DISCOIDEI. *Apothecia scutelliform, subsessile, furnished with a disk formed of a peculiar coloured substance, and surrounded by a margin of a different colour arising from the thallus.*

15. URCEOLARIA.

Universal receptacle crustaceous, spreading, plane, adnate, uniform. *Partial receptacle* scutelliform, its disk concave coloured immersed in the crust, its margin formed of the crust and of the same colour.

1. U. *Acharii*, crust with a rather decided edge smooth with narrow cracks pale brick coloured, disk reddish the margin tumid. *Ach. Syn. Lich. p.* 137. *Lichen Acharii, E. B. t.* 1087.

β. *cyrtapsis*, crust bordered smooth tessellated reddish at length white, apothecia becoming elevated with the disk rather convex reddish brown reaching the margin of the crust. *Lichen punctatus, E. B. t.* 450.

HAB. Common on rocks in the Isle of Mull, also at Sheean Ferry, *Mr. Turner* and *Hook.* β. Rocks, Scotland, *Dickson.*

16. LECANORA.

Universal receptacle crustaceous, spreading, plane, adnate, uniform. *Partial receptacle* scutelliform, thick, sessile and adnate; *disk* plano-convex, its *margin* thickish, formed of the crust and of the same colour, somewhat free.

* *Thallus adnate, uniform.*

† *Disk of the apothecia black, naked.*

1. L. *atra*, crust with a somewhat decided edge granulated and cracked greyish white, disk of the apothecia plane at length swelling and black, the margin free raised at length waved and crenulate. *Ach. Syn. Lich. p.* 146. *Lichen ater, Lightf. p.* 813. *E. B. t.* 949.

HAB. Common on the bark of trees, and on walls and rocks.

2. L. *oculata*, crust glabrous papillose and branched white, apothecia sessile scattered, disk slightly concave black, margin tumid. *Ach. Syn. Lich. p.* 148. *Isidium oculatum, Lich. Univ. p.* 576. *Lichen oculatus, E. B. t.* 1833. *Lichen dactylinus, Wahl. Lapp.*

HAB. Rocks in Scotland, *Mr. Dickson.* On Ben Lawers, growing upon moss and grass, *Mr. Turner* and *Hook.*

†† *Apothecia brown in the disk.*

3. L. *subfusca*, crust cartilaginous smooth at length granulated unequal white or greyish, disk of the apothecia plano-convex brown or almost black, margin tumid entire at length waved and crenate. *Ach. Syn. Lich. p.* 157. *Lichen subfuscus, p.* 813.

Hab. Trunks of trees, walls and rocks, common.

4. L. *ventosa*, crust tessellated with tumid warts yellow green or grey, apothecia appressed at length irregular with the disk plane or swelling red brown at length rising above the entire margin. *Ach. Syn. Lich. p.* 159. *Lichen ventosus, Lightf. p.* 806. *E. B. t.* 906.

Hab. Rocks upon the mountains, common.

5. L. *frustulosa*, crust tartareous very much cracked variegated with black and white (yellowish white in dispersed tumid warts, *Sm.*), apothecia pale brown at length convex dark brown, margin white. *Ach. Syn. Lich. p.* 159. *E. B. t.* 2273 (*Lichen frustul.*).

Hab. Rocks in Scotland, *Dickson*. On Ben Lawers, *Mr. Borrer* and *Hook*.

6. L. *ochroleuca*, crust thin leprose white, apothecia crowded elevated, disk plane olive, the margin waved. *Ach. Syn. Lich. p.* 180. *Lichen ochrol., E. B. t.* 1373.

Hab. Mountains of Scotland, upon the ground.

††† *Disk of the apothecia black, but covered with a powdery substance or bloom.*

7. L. *Glaucoma*, crust tartareous tessellated even greyish white, apothecia immersed in the crust, the disk plane at length convex subglobose glaucous and powdery, margin entire afterwards obliterated. *Ach. Syn. Lich. p.* 165. *Lichen Glaucoma, E. B. t.* 2156. *L. rupicola, Lightf. p.* 806.

Hab. On rocks, not unfrequent. At the fall of Fyers, *Mr. Turner* and *Hook*. On slate and whin stones, on Campsie hills, *Hopk.*

†††† *Disk of the apothecia somewhat flesh-coloured, pale, testaceous, yellowish or orange.*

8. L. *Perellus*, crust granulated or somewhat warted white, apothecia thick crowded by pressure angular, the disk concave and as well as the tumid entire margin of the same colour as the crust. *Ach. Syn. Lich. p.* 169. *Lichen Perellus, E. B. t.* 726. *Lightf. p.* 814.

β. *upsaliensis*, crust very thin membranaceous smooth glaucous white bearing awl-shaped bristles, disk of the apothecia at length spreading plane pale yellowish. *L. upsaliensis, E. B. t.* 169.

Hab. Stones and rocks in exposed situations, frequent. Walls and stones, at Helensburgh, common, *Hopk.* β. Not uncommon on the ground, and covering grass and mosses.

Affords a purple or crimson dye, and called in the south of France, where it is employed in lieu of the *L. tartarea*, *Perelle d'Auvergne*, whence the specific name, as Smith tells us, though generally spelled *Parellus*. *L. Turneri* is probably only a var. growing upon the bark of trees.

9. L. *tartarea,* crust tartareous with clustered granules greyish white, apothecia scattered, disk plano-convex a little wrinkled flesh-colour, the margin inflexed at length waved. *Ach. Syn. Lich. p.* 172. *Lichen tartareus, Lightf. p.* 811. *E. B. t.* 156.

γ. crust thin glaucous white running out into papillæ and spinuliferous branches. *Lichen frigidus, E. B. t.* 1879.

Hab. Most abundant upon rocks, especially in the alpine districts. β. on the ground, mosses, &c.

This is the famous *Cudbear* (so called after a Mr. Cuthbert, who first brought it into use) employed to produce a purple for dyeing woollen yarn; and no where, perhaps, used to so great an extent as in the manufactory of Mr. Mackintosh at Glasgow. The manufacturers import it largely from Norway, where it grows more abundantly than with us; yet in the Highland districts many an industrious peasant gets a living by scraping this Lichen with an iron hoop, and sending it to the Glasgow market. When I was in the neighbourhood of Fort Augustus, in 1807, a person could earn 14*s.* per week at this work, selling the material at 3*s.* 4*d.* the stone of 22 lbs. The fructified specimens are reckoned the best.

10. L. *vitellina,* crust granulated bright yellow, apothecia crowded, the disk plane of the same colour as the crust at length convex deeper coloured and powdery, the margin elevated thin at length waved pulverulent. *Ach. Syn. Lich. p.* 174. *Lichen vitellinus, E. B. t.* 1792. *L. candelarius,* α. *Lightf. p.* 800.

Hab. On pales and smooth wood exposed to the weather, common, *Lightf., Hopk.*

11. L. *erythrella,* crust cracked subrugose greenish yellow, apothecia at length subglobose deep orange shining, when the entire margin becomes obliterated. *Ach. Syn. Lich. p.* 175. *E. B. t.* 1993.

Hab. On stone walls near Killin, at the head of Loch Tay, *Mr. Turner* and *Hook.*

††††† *Disk of the Apothecia red.*

12. L. *rubra,* crust submembranaceous smooth at length unequal pulverulent and granular white, apothecia crowded, the disk concave red, margin tumid inflexed crenulate. *Ach. Syn. Lich. p.* 177. *Lichen Ulmi, E. B. t.* 2218.

Hab. On trunks of trees at the foot of Ben Lawers, *Mr. Mackay.*

13. L. *Hæmatomma,* crust tartareous pulverulent whitish, apothecia imbedded scattered subconfluent, the disk scarlet rather convex, the margin sometimes obliterated. *Ach. Syn. Lich. p.* 178. *Lich. Hæmatomma, E. B. t.* 486, and *p.* 223 (*Lich. coccineus*).

Hab. Rocks on Salisbury craigs, *Sir J. E. Smith.* Rosslyn wood, and rocks in the King's Park, *Maugh.* On the largest cross among the ruins at Iona, *Mr. Turner* and *Hook.*

** *Thallus adnate, radiato-stellate, and somewhat lobed in the circumference.*

14. L. *epigea*, crust plaited and wrinkled white the circumference smooth lobed, disk of the apothecia at length rather convex brownish black, the margin thin entire. *Ach. Syn. Lich. p.* 179. *Lichen candicans*, *E. B. t.* 1778.

HAB. On the ground near Sheean Ferry, *Mr. Turner* and *Hook.*

15. L. *murorum*, crust plaited and lobed cracked bright yellow-orange pulverulent the circumference plicate and rayed the segments linear convex cut, apothecia crowded, the disk at length convex of a deeper orange, margin entire waved. *Ach. Syn. Lich. p.* 181. *Lichen murorum*, *E. B. t.* 2157. *L. candelarius*, β. *Lightf. p.* 811.

HAB. Walls, rocks, and stones, *Lightf.*, *Hopk.*

16. L. *elegans*, crust somewhat imbricated plaited and rugose tawny orange naked, lobes linear lanceolate waved convex somewhat distant radiating, disk of the apothecia concave of the same colour with the crust, margin somewhat inflexed entire. *Ach. Syn. Lich. p.* 182. *Lichen elegans*, *E. B. t.* 2181.

HAB. Rocks, Scotland, *Dickson.* Rocks on Cathkin hills, and frequent about Helensburgh, *Hopk.*

17. L. *circinata*, crust cracked greyish plaited and rayed in the circumference linear-laciniate, apothecia much crowded at length angular, disk plane brownish black even with the margin of the crust. *Ach. Syn. Lich. p.* 184. *Lichen circinatus*, *E. B. t.* 1941.

HAB. On flat stones, not unfrequent. Walls at Cathkin, *Hopk.*

18. L. *gelida*, crust cracked pale reddish grey the circumference rayed and lobed having brown warts in the centre cracked and rayed, disk of the apothecia depressed reddish margin thick elevated entire. *Ach. Syn. Lich. p.* 186. *Lichen gelidus*, *E. B. t.* 699.

HAB. Rocks, first discovered by *Dr. Francis Hamilton* (late *Buchanan*) in the Glen of Lenay, near Stirling. Rocks on Ben Lomond, and at the castle of Kilchurn, near Dalmally, *Mr. Turner* and *Hook.*

*** *Thallus imbricated throughout.*

19. L. *squamulosa*, crust with lobed scales of a brownish ash-colour, disk of the apothecia immersed nearly plane blackish brown with the margin at length prominent. *Ach. Syn. Lich. p.* 188 (*L. cervina*). *Lichen squamulosus*, *E. B. t.* 2011.

HAB. Rocks and stones in Scotland, *Dickson.* About Loch Carron, Ben Lomond, and other parts of the Highlands, *Mr. Turner* and *Hook.*

20. L. *crassa*, crust scaly greenish, lobes imbricated inciso-crenate waved irregular, disk of the apothecia slightly swelling brownish orange margin thin entire at length obliterated. *Ach. Syn. Lich. p.* 191. *Lichen crassus, E. B. t.* 1893. *Lich. cartilagineus, Lightf. p.* 815.

Hab. Rocks thinly covered with earth, not unfrequent, as in the King's Park, Edinb., *Lightf.*

21. L. *candelaria*, crust scaly yellow, lobes very much crowded cut and laciniated imbricated their margins minutely granular, apothecia nearly of the same colour as the crust margin elevated entire. *Lightf. p.* 192. *Lichen candelarius, E. B. t.* 1794.

β. *polycarpa*, crust formed of lobes with many crowded teeth and segments greyish yellow, apothecia crowded waved, disk plane dilated of the same colour as the crust at length fulvous and the margin crenulated. *Lichen polycarpus, E. B. t.* 1795.

Hab. Old posts and doors, occasionally, *Hopk.* β. with α.

This plant derives its name from the circumstance of the Swedes employing it to stain the candles that are used in their religious ceremonies.

22. L. *hypnorum*, crust scaly greenish brown, lobes minute somewhat rounded with the margin granular and crenulated, apothecia submembranaceous, the disk concave at length dilated plane reddish brown the margin elevated inflexed crenate. *Ach. Syn. Lich. p.* 193. *Lichen hypnorum, E. B. t.* 740.

Hab. Rosslyn wood, *Maugh.*

23. L. *carnosa*, crust scaly livid brown, lobes irregularly and deeply cut and laciniated, apothecia thick with the disk plane reddish brown at length elevated and obliterating the entire margin. *Ach. Syn. Lich. p.* 193 (*L. muscorum*). *Lichen carnosus, E. B. t.* 1684.

Hab. Wet rocks among moss, not uncommon in the Highlands.

24. L. *brunnea*, crust imbricated lobed and granulated ash-coloured brown, apothecia imbedded in the crust crowded irregular, disk rather convex red-brown the margin elevated crenulated persistent. *Ach. Syn. Lich. p.* 193. *Lichen brunneus, E. B. t.* 1246.

Hab. Discovered in Britain, by *Dr. Burgess*, in Dumfries-shire, and *Dr. Hamilton* (late *Buchanan*) near stirling. Not uncommon on the ground in heathy places. Pentland hills, *Maugh.*

25. L. *Hookeri*, crust imbricated greyish, lobes minute appressed blunt, disk of the apothecia plane black margin elevated and crenate. *Ach. MSS.* (according to Swartz). *Lichen Hookeri, E. B. t.* 2283. *Lichen leucolepis, Wahl. Lapp. p.* 420. *Lecanora leucolepis, Ach. Syn. Lich. p.* 194.

Hab. On wet micaceous rocks of Mael Greadha and Ben Lawers, *Mr. Borrer* and *Hook.*

17. PARMELIA.

Universal receptacle foliaceous, between coriaceous and membranaceous, spreading, appressed, orbicular, lobed and stellated or multifid and laciniated, fibrous beneath. *Partial recept.* scutelliform, submembranaceous, beneath formed of the thallus, free, and attached to it by a central point. *Disk* concave, coloured, its margin formed by the inflexed crust.

* *Thallus with its segments not inflated at the extremity* (Circinaria).

1. P. *glomulifera*, thallus cartilaginous rigid orbicular livid and glaucous smooth bearing dark green scattered tufted excrescences, tawny beneath and downy, the lobes waved and laciniated angular, apothecia reddish brown rugose at the margin. *Ach. Syn. Lich. p.* 195. *Lichen glomuliferus, E. B. t.* 293. *Lightf. p.* 853.

HAB. Trunks and roots of trees in shady woods, but not common, *Lightf.* Duke of Argyle's grounds, near Inverary, but without apothecia, *Mr. Turner* and *Hook.* Pentland hills, *Maugh.*

2. P. *caperata*, thallus orbicular pale yellowish green rugose at length granulated black and hispid beneath, the lobes waved laciniated rounded nearly entire, apothecia scattered brown their margin incurved entire at length pulverulent. *Ach. Syn. Lich. p.* 196. *Lichen caperatus, Lightf. p.* 837. *E. B. t.* 654.

HAB. Trunks of trees, rocks, and pales, frequent.

3. P. *perlata*, thallus orbicular greyish white smooth, blackish brown and hairy beneath, lobes rounded cut plane, their margin waved entire, apothecia brown their margin thin entire. *Ach. Syn. Lich. p.* 197. *Lichen perlatus, Lightf. p.* 839. *E. B. t.* 341.

HAB. Trunks of oaks and other trees, very common, *Lightf.*

4. P. *herbacea*, thallus orbicular membranaceous bright green above, beneath pale brown almost white and downy, lobes waved and cut the segments rounded subcrenate, apothecia red, the margin inflexed rugose and crenate. *Ach. Syn. Lich. p.* 199. *Lichen læte-virens, Lightf. p.* 852. *E. B. t.* 294.

HAB. Trunks and roots of trees, sometimes on rocks in moist shady places, not uncommon.

5. P. *olivacea*, thallus orbicular olive brown rugged with elevated points paler beneath and fibrous, lobes radiating appressed plane dilated rounded and crenate, apothecia dark brown the margin crenulated. *Ach. Syn. Lich. p.* 200. *Lichen olivaceus, Lightf. p.* 818. *E. B. t.* 2180.

HAB. On trees and rocks, common.

6. P. *parietina*, thallus orbicular bright yellow, beneath paler and fibrillose, the lobes radiating appressed plane dilated rounded crenate and crisped at the extremity, apothecia of

the same colour as the crust their margin entire. *Ach. Syn. Lich. p.* 200. *Lichen parietinus, Lightf. p.* 822. *E. B. t.* 194.

Hab. On trees, walls, &c. abundant.

7. P. *lanuginosa*, thallus orbicular yellowish white pulverulent, greyish black and downy beneath, lobes imbricated plane rounded slightly crenated, apothecia reddish ("of the same colour as the crust," *Dicks.*) their margin pulverulent. *Ach. Syn. Lich. p.* 201. *Lichen membranaceus, Dicks. Pl. Crypt. fasc.* 2. *p.* 21. *t.* 6. *f.* 1.

Hab. On rocks lightly covered with earth, in the Highlands, *Dicks.*

This species is not taken up in *Eng. Bot.*, but it appears very distinct from any other.

8. P. *plumbea*, thallus orbicular blueish grey, beneath having a very thick spongy down, the lobes of the circumference rounded and crenate, apothecia scattered at length convex rusty brown their margin of the same colour and entire. *Ach. Syn. Lich. p.* 202. *Lichen plumbeus, Lightf. p.* 826. *t.* 26. *f.* 2. *E. B. t.* 353.

Hab. Trunks of trees, not unfrequent in the Highlands, as at Arroquhar and Inverary.

9. P. *rubiginosa*, thallus orbicular brownish grey, beneath having a blueish grey spongy down, lobes of the circumference obtusely notched elevated pale, apothecia plane crowded central reddish brown with tumid incurved crenulated whitish margins. *Ach. Syn. Lich. p.* 202. *Lichen affinis, E. B. t.* 983.

Hab. Trunks of trees, often with the last, Duke of Argyle's grounds at Inverary, and on the sides of Loch Lomond, *Mr. Turner* and *Hook.*

10. P. *omphalodes*, thallus orbicular dark purplish brown shining dotted with black, beneath black and fibrillose, the segments sinuato-multifid linear plane truncated crenate in the circumference, apothecia dark brown the margin slightly crenulate. *Ach. Syn. Lich. p.* 203. *Lichen omphalodes, Lightf. p.* 818. *E. B. t.* 604.

Hab. On rocks every where; abundant on the dry stony moors.

This is much used by the Highlanders in dyeing a reddish-brown colour. They steep it in urine for a considerable time till it becomes soft and like paste; then forming the paste into cakes, they dry them in the sun and preserve them for use. *Lightf.*

11. P. *saxatilis*, thallus orbicular greyish rough and pitted beneath black and fibrillose, the segments imbricated sinuated plane subretuse, apothecia bright chesnut brown their margin subcrenulated. *Ach. Syn. Lich. p.* 204. *Lichen saxatilis, Lightf. p.* 816. *E. B. t.* 603.

Hab. Stones and trunks of trees, but not very common in fructification.

12. P. *fahlunensis*, thallus orbicular pitchy brown smooth, beneath black and scarcely fibrillose, the segments sinuated

multifid divergent plane or slightly grooved their margins elevated lacerated, apothecia dark brown the margin granulated. *Ach. Syn. Lich. p.* 204. *Lichen fahlunensis, Lightf. p.* 819. *E. B. t.* 653.

HAB. Rocks on the more elevated Highland mountains, not uncommon.

13. P. *stygia*, thallus stellated shining pitchy black, beneath black and almost naked, the segments nearly linear multifid and somewhat palmate convex, the margins and extremity recurved, apothecia of the same colour at length black with the margin crenated. *Ach. Syn. Lich. p.* 205. *Lichen stygius, E. B. t.* 2048.

HAB. Summits of the Highland mountains, plentiful, as upon Ben Nevis, growing on the rocks.

14. P. *aquila*, thallus orbicular tawny brown paler beneath with blackish fibres, the segments multipartite nearly linear convex those of the circumference dilated nearly plane and crenate, apothecia dark brown their margin crenated. *Ach. Syn. Lich. p.* 205. *Lichen pullus, Lightf. p.* 825 (*according to Smith*). *Lichen aquilus, E. B. t.* 982.

HAB. Rocks, not unfrequent, as in the King's Park, Edinburgh, &c. *Lightf.* Hermitage and Pentland Hills, *Maugh.*

15. P. *encausta*, thallus stellated pale grey, beneath black unequal naked, the segments often uniting convex and almost rounded linear multifid roughish dotted with black, apothecia reddish brown their margin somewhat crenulated. *Ach. Syn. Lich. p.* 206. *Lichen encaustus, E. B. t.* 2049.

HAB. Plentiful on rocks on the summit of Ben Nevis, where it was first discovered by *Dr. Stuart.*

16. P. *recurva*, thallus stellated pale greenish bearing powdery warts, beneath black with spongy fibres, the segments of the circumference multifid very narrow convex and almost rounded, apothecia reddish brown their margin nearly entire. *Ach. Syn. Lich. p.* 206. *Lichen incurvus, E. B. t.* 1375.

HAB. Rocks, *Dickson* and *G. Don.* On Ben Lomond, rare, *Mr. Turner* and *Hook.*

17. P. *sinuosa*, thallus stellated pale yellowish grey smooth, black and fibrous beneath, the segments broadly linear sinuato-pinnatifid their sinuses broad and circular, apothecia nearly plane dark brown, their margin thin entire. *Ach. Syn. Lich. p.* 207. *Lichen sinuosus, E. B. t.* 2050.

HAB. First discovered by *Mr. James Burgess Mac-Garroch* on moorstones in Dumfries-shire. Old walls at Ballacheulish, *Mr. Turner* and *Hook.* Stones on Cathkin Hills, not unfrequent, *Hopk.*

This has never, I believe, been found with shields in Britain; nor, indeed, has it been met with out of Scotland.

18. P. *aleurites*, thallus orbicular continuous rugose pale grey pulverulent, beneath of the same colour with blackish fibres, seg-

ments in the circumference distinct plane rounded waved inciso-crenate, apothecia plane reddish brown their margin at length crenulate and pulverulent. *Ach. Syn. Lich. p.* 208. *Lichen aleurites, E. B. t.* 858.

HAB. Trunks of trees, posts, rails, &c.

19. P. *ambigua,* thallus stellated pale yellow green smooth bearing powdery warts, beneath brownish black and fibrillose, the segments linear appressed plane dichotomous somewhat truncated, apothecia subcentral small nearly plane brown their margin entire. *Ach. Syn. Lich. p.* 208. *Lobaria ambigua, Hoffm. Pl. Lich. t.* 40. *f.* 2—4, and *t.* 42. *f.* 2, 3 (*P. sona*).

HAB. Trunks of fir trees in the Highlands, about Cairngorum, *Mr. Borrer* and *Hook.* Bark of firs about Kinnordy, Kerrie-muir, always barren.

20. P. *conspersa,* thallus orbicular greenish yellow smooth with blackish dots, brown and fibrillose beneath, the segments sinuato-lobate rounded crenate nearly plane, apothecia central chesnut brown with the margin nearly entire. *Ach. Syn. Lich. p.* 209. *Lichen centrifugus, Lightf. p.* 814. *Lichen conspersus, E. B. t.* 2097.

HAB. Rocks, common.

21. P. *speciosa,* thallus stellated glabrous greenish white, beneath snowy white with greyish fibres, the segments imbricated linear plane cut and branched crenate their extremities ascending and powdery, apothecia central brown with a tumid singularly rough and crenate border. *Ach. Syn. Lich. p.* 211. *Lichen speciosus, E. B. t.* 1079.

HAB. In a wood between Ballacheulish and Linnhe Loch, *Mr. Turner* and *Hook.*

22. P. *lævigata,* thallus stellate smooth greyish white, beneath black and fibrillose, the segments multifid linear broader upwards cut divaricated acute in the circumference frequently bearing powdery warts, apothecia concave chesnut colour with the margin entire. *Ach. Syn. Lich. p.* 212. *Lichen lævigatus, E. B. t.* 1852.

HAB. On trees in Ross-shire, *Mr. Borrer* and *Hook.*

23. P. *pulverulenta,* thallus stellated deep glaucous green cæsious and pruinose when dry, beneath black and downy and hispid, the segments linear multifid in the circumference plane appressed waved retuse at the extremities, apothecia glaucous black the margin entire and waved at length leafy. *Ach. Syn. Lich. p.* 214. *Lichen pulverulentus, E. B. t.* 2063. *L. stellaris, β. Lightf. p.* 824.

HAB. Very common on the trunks of trees.

24. P. *stellaris,* thallus stellated at length rugged and granulated greyish green, beneath with grey fibres, the segments sublinear

rather convex cut multifid, apothecia glaucous black their margin entire at length waved and crenate. *Ach. Syn. Lich. p.* 216. *Lichen stellaris, Lightf. p.* 824. *E. B. t.* 1697.

HAB. Trunks of trees, common.

** *With the segments of the thallus inflated at the extremity* (Physcia).

25. P. *physodes*, thallus substellated glaucous white, beneath brownish black, the segments sinuato-multifid convex glabrous inflated and ascending at the extremity, apothecia red brown their margin entire. *Ach. Syn. Lich. p.* 218. *Lichen physodes, E. B. t.* 126.

HAB. Rocks, on the Pentland Hills, *Maugh.* Cathkin Hills, plentiful, *Hopk.*

The fruit is very rare. Besides the true apothecia, there are often pedunculated whitish powdery warts.

22. P. *diatrypa*, thallus substellate greyish green, beneath rugose blackish and white, the segments sinuato-multifid nearly plane smooth bearing powdery warts and perforated, the extremities inflated, apothecia reddish their margin entire. *Ach. Syn. Lich. p.* 219. *Lichen diatrypus, E. B. t.* 1248.

HAB. Wet rocks among moss, rare. At Balacheulish, bearing fructification.

18. BORRERA.

Universal receptacle cartilaginous, branched and laciniated, the segments free, generally channelled beneath, and the margins ciliated. *Partial recept.* scutelliform, thick, formed of the *thallus* beneath, its disk coloured and surrounded by the elevated and inflexed margin formed also of the thallus.

1. B. *Ciliaris*, thallus glaucous green the segments linear branched attenuated ciliated especially towards the apices beneath whitish and channelled, apothecia mostly terminal their disk concave at length plane blackish brown glaucous, the margin crenate and fimbriated. *Ach. Syn. Lich. p,* 221. *Lichen ciliaris, Lightf. p.* 828. *E. B. t.* 1352.

HAB. Trunks of trees, frequent.

2. B. *tenella*, thallus greyish white naked on both sides and of the same colour substellated, the segments pinnatifid ascending dilated arched and ciliated at the extremity, apothecia scattered, the disk plane cæsious black its margin entire. *Ach. Syn. Lich. p.* 221. *Lichen tenellus, E. B. t.* 1351. *Lichen ciliaris, β. Lightf. p.* 828.

HAB. On the branches of trees.

3. B. *furfuracea*, thallus greenish grey farinaceous the segments linear attenuated branched grooved naked rugose and blackish beneath, apothecia somewhat marginal cup-shaped with their margin thin inflexed. *Ach. Syn. Lich. p.* 222. *Lichen furfuraceus, Lightf. p.* 832. *E. B. t.* 984.

Hab. Trunks of old trees and pales, but not very common, *Lightf.*

4. B. *flavicans,* thallus yellow naked, segments dichotomously branched slightly compressed attenuate divaricated complicated, apothecia scattered their disk plane orange red their margin entire naked. *Ach. Syn. Lich. p.* 225. *Lichen flavicans, E. B. t.* 2113. *Lichen vulpinus, Lightf. p.* 896.

Hab. Trunks of old trees, but not common. On the ground on the Craig of Ailsa, *Lightf.*

19. CETRARIA.

Universal réceptacle between cartilaginous and membranaceous, ascending or spreading, lobed and laciniated, on each side smooth and naked. *Partial recept.* scutelliform, obliquely adnate with the margin of the *thallus,* the lower portion being free (not united with the thallus), the upper sessile, the *disk* coloured, plano-concave, with a margin formed of the *thallus* and inflexed.

1. C. *juniperina,* thallus pale yellow very yellow beneath, the segments plane ascending erose crenate and crisped, apothecia elevated their disk brown the margin crenulated. *Ach. Syn. Lich. p.* 226.

β. *pinastri,* thallus with the segments depressed the lobes rounded crenate the margins crisped pulverulent and very yellow. *Lichen pinastri, E. B. t.* 2111. *Lichen juniperinus, Lightf. p.* 836.

Hab. Trunks and branches of elms and many other trees, common. Fir trees about Aviemore and at Kinnordy Kerrie-muir, *Hook.* Never, I believe, found with *apothecia* in Britain; though not rare in that state in Switzerland.

2. C. *sepincola,* thallus olive-brown paler beneath the segments plane ascending lobed waved subcrenate, apothecia elevated of the same colour their margin rugose and crenulate. *Ach. Syn. Lich. p.* 227. *Lichen sepincola, E. B. t.* 2386.

Hab. On stones in the Scotch mountains, according to *Mr. Dickson.* I have never seen it in any country but on wood. On fir trees at Kinnordy Kerrie-muir, *Mr. Lyell* and *Hook. Fructification* very rare.

3. C. *glauca,* thallus glaucous somewhat shining sinuated and lobed brown beneath, the segments cut and jagged curled ascending, apothecia elevated chesnut brown their margin wrinkled. *Ach. Syn. Lich. p.* 227. *Lichen glaucus, Lightf. p.* 838. *E. B. t.* 1066.

β. *fallax,* thallus white on each side, or with occasional black spots beneath. *L. fallax, E. B. t.* 2373.

Hab. On the ground in heathy places, on rocks and trees, not uncommon. β. On the ground near the cascade at Inverary.

4. C. *nivalis,* thallus sulphur-coloured orange at the base pitted

and reticulated erect nearly plane laciniated, its segments multifid crisped crenato-dentate and often warted at the points, apothecia pale flesh-colour their margin crenulated. *Ach. Syn. Lich. p.* 228. *Lichen nivalis, E. B. t.* 1994.

HAB. Native of Scotland, *Dr. R. Townson, Smith* in *E. B.* Rocks in Scotland, Ben Lawers. Summit of Cairngorum, *Hook.*

Fructification, I believe, never found with us.

5. C. *islandica,* thallus olive brown paler beneath, the segments erect sublinear multifid channelled smooth dentato-ciliate, the fertile branches spreading, apothecia appressed plane of the same colour, their margin elevated entire. *Ach. Syn. Lich. p.* 229. *Lichen islandicus, Lightf. p.* 829. *E. B. t.* 1330.

HAB. Rocky places. Upon most of, if not all, the lofty Highland mountains; but never, that I am aware of, bearing *apothecia* with us.

Though plentiful with us, it is scarcely sufficiently so to form an article of commerce. A great proportion of what comes to our shops, where it is in great request as a medicine in coughs, consumptions, &c., is procured from Norway or from Iceland. Immense quantities are gathered in the latter country, not only for sale, but for home consumption, as an article of common food. The bitter and purgative quality being extracted by steeping in water, the Lichen is dried, reduced to powder, and made into a cake, or boiled and eaten with milk; and eaten with thankfulness, too, by the poor natives, who confess "that a bountiful Providence sends them bread out of the very stones."

20. STICTA.

Universal receptacle foliaceous, coriaceo-cartilaginous, spreading, lobed, free and pubescent beneath, with little cavities or hollow spots. *Partial recept.* scutelliform, formed of the *thallus* beneath, appressed and fixed to it by a central point; its disk coloured, plane, surrounded by the margin of the crust, which reaches beyond it.

*1. S. *crocata,* thallus dark glaucous brown pitted with broad rounded spreading entire lobes having bright lemon coloured powdery spots upon the margin and on the elevated parts between the pits, downy and tawny beneath with minute lemon coloured little hollows, apothecia scattered blackish brown their margin entire. *Ach. Syn. Lich. p.* 232. *Lichen crocatus, E. B. t.* 2110.

HAB. "On rocks in the Highlands," *Dickson.* Upon trees, rare, in the Duke of Argyle's grounds, Inverary, *Mr. Turner* and *Hook.*

2. S. *pulmonaria,* thallus olivaceous pitted and reticulated, downy beneath with smooth prominences, the segments sinuato-lobate truncated, apothecia submarginal plane reddish their margin rugose. *Ach. Syn. Lich. p.* 233 (*S. pulmonacea*). *Lichen pulmonarius, Lightf. p.* 831. *E. B. t.* 572 (*too green*).

HAB. Trunks of old trees in shady woods, plentiful. On old walnut trees, at Barncluith, near Glasgow, *Hopk.*

3. S. *scrobiculata*, thallus suborbicular glaucous greyish green very broad somewhat pitted and having mealy warts, beneath downy tawny with white naked spots, the segments rounded and lobed irregular, apothecia scattered nearly plane reddish brown their margin somewhat crenate. *Ach. Syn. Lich. p.* 134. *Lichen scrobiculatus, Lightf. p.* 850. *E. B. t.* 497.

HAB. Trunks of trees and on rocks, among moss, Pentland Hills, *Maugh.*

4. S. *limbata*, thallus orbicular glaucous brown roundly lobed smooth grey and powdery at the margin, downy beneath with white hollow spots, apothecia brown. *Ach. Syn. Lich. p.* 236. *Lichen limbatus, E. B. t.* 1104.

HAB. Rocks in Scotland, *Mr. Menzies.* At the Hermitage, near Edinburgh, *Sir J. E. Smith.* On rocks and trees in shady places, by the sides of Loch Lomond, and near the Falls of the Clyde, *Mr. Turner* and *Hook.*

5. S. *fuliginosa*, thallus orbicular dark lurid grey rough with brown granules, beneath greyish brown with white concave spots, the segments roundly lobed nearly entire, apothecia scattered dark brown their margin entire. *Ach. Syn. Lich. p.* 236. *Lichen fuliginosus, E. B. t.* 1103.

HAB. On moist rocks near the Falls of the Clyde, and near Inverary and Ballycheulish, *Mr. Turner* and *Hook.*

Has a very dingy appearance and unpleasant smell.

6. S. *sylvatica*, thallus wide rusty brown naked and pitted, brown and downy beneath with small pale excavations, segments lobed and obtusely cut unequal, apothecia marginal dark brown. *Ach. Syn. Lich. p.* 236. *Lichen sylvaticus, Lightf. p.* 848. *E. B. t.* 2298.

HAB. Shady woods about the roots of trees, frequent, *Lightf.* Falls of the Clyde, *Hopk.* Woods, Inverary and Ballacheulish, *Mr. Turner* and *Hook.*

Smell very fetid. *Apothecia* rare; never found in Britain, but by *Dr. Burgess,* as mentioned in *E. B.*

21. PELTIDEA.

Universal receptacle foliaceous, coriaceous, spreading, subadnate, lobed; with woolly veins beneath. *Partial recept.* formed upon the upper side of a produced portion of the under surface of the *thallus*, orbicular, subobliquely adnate, having a thin elevated margin of the substance of the *thallus*.

1. P. *venosa*, thallus greenish ash-colour, white beneath having dark brown prominent branched veins, lobes rounded cut somewhat entire, apothecia marginal plane rounded swelling brown scarcely crenulate at the margin. *Ach. Syn. Lich. p.* 237. *Lichen venosus, Lightf. p.* 814. *E. B. t.* 887.

Hab. On the earth in moist situations, among rocks, most frequent in the Highlands; Glenkill Linn and Burn, Dumfries-shire, *Dr. Burgess.* Pass of Killicrankie, *Mr. Turner* and *Hook.* On the earth of walls, Blair in Athol, *Mr. Borrer* and *Hook.*

This is a small but very pretty species.

2. P. *scutata*, thallus ash-coloured whitish and veiny beneath, the lobes rounded sinuated and cut crenate and crisped, fertile lobules very short, apothecia orbicular ascending nearly plane brown somewhat entire. *Ach. Syn. Lich. p.* 237. *Lichen scutatus, E. B. t.* 1834.

Hab. Bark of trees, *Dickson.* I believe very rare. I never saw it any where but upon trees in the Duke of Argyle's grounds at Inverary, in company with *Mr. Turner.*

3. P. *horizontalis*, thallus glaucous and brownish green lobed crenate and shining pale beneath with numerous brown branching reticulated veins, fertile lobules abbreviated, apothecia terminal plane horizontal transversely oblong reddish brown with a nearly entire margin. *Ach. Syn. Lich. p.* 238. *Lichen horizontalis, Lightf. p.* 849. *E. B. t.* 888.

Hab. Moist shady rocks and about the roots of trees, not uncommon, *Lightf.*

4. P. *aphthosa*, thallus green smooth roundly lobed sprinkled with brown warts, whitish beneath with brown branching veins, fertile lobules very long contracted in the middle their sides reflexed, apothecia terminal large ascending red-brown with a lacerated margin. *Ach. Syn. Lich. p.* 238. *Lichen aphthosus, Lightf. p.* 847. *E. B. t.* 1119.

Hab. Moist situations among rocks and moss, or by the roots of trees. Foot of the Pentland Hills, *Mr. Yalden.* Moist rocks near the Falls of the Clyde, with shields, *Mr. Turner* and *Hook.*

A large handsome species; has its name from the circumstance related by Linnæus, that the Swedish peasants boil it in milk as a cure for the *aphthæ*, or *thrush,* in children.

5. P. *canina*, thallus greyish green with broad rounded lobes, white beneath with brownish branching veins, fertile lobules rather long with their sides reflexed, apothecia terminal nearly erect revolute reddish brown with a subcrenulated border. *Ach. Syn. Lich. p.* 239. *Lichen caninus, Lightf. p.* 845. *E. B. t.* 2299.

β. *rufescens*, thallus polyphyllous concave reddish brown, pale reddish white beneath with obsolete veins, lobes rounded incurved, fertile lobules short, apothecia terminal erect roundish dark brown nearly entire at the margin. *E. B. t.* 2300 (*Lichen rufescens*). *Peltidea canina, β.? Ach. Syn. Lich. p.* 239. *Lichen caninus, β. Lightf. p.* 846.

Hab. Upon the ground, among moss, roofs of houses, trees, &c. very common. β. with α.

Formerly used, at the suggestion of Dr. Mead, as a cure for the bite of a mad dog, but without success.

6. P. *polydactyla*, thallus glaucous green naked glabrous with brown reticulated veins beneath, fertile lobules very numerous elongate and as well as the brown terminal apothecia cucullato-revolute. *Ach. Syn. Lich. p.* 248. *Lichen caninus, γ. Lightf. p.*846. *Lichen polydactylus, Jacq. Coll. t.* 14.*f.* 2. *a.* 6.

HAB. On the ground, but rather rare, *Lightf.*

22. NEPHROMA.

Universal receptacle foliaceous, coriaceo-membranaceous, spreading, lobed, free, and naked, or hairy beneath. *Partial recept.* resupinate (on the underside), formed upon a produced portion of the upper surface of the *thallus*, reniform, adnate, coloured, plane, its margin of the same substance as the *thallus.*

1. N. *resupinata*, thallus greyish brown pale pubescent and granulated beneath, fertile lobules very short, apothecia large numerous reddish. *Ach. Syn. Lich. p.* 241. *Lichen resupinatus, Lightf. p.* 843. *E. B. t.* 305.

HAB. Rocks among moss, on the stems and roots of trees, not uncommon. Dumbarton castle, *Sir J. E. Smith.* Sides of Loch Lomond, at Inverary, and in Aros Mull, *Mr. Turner* and *Hook.*

Readily distinguished as a genus from the last, by bearing its *apothecia* on the under instead of the upper side of the *thallus.*

23. EVERNIA.

Universal receptacle subcrustaceous, branched, and laciniated, angular or compressed, nearly erect or pendulous, with a central thread within. *Partial recept.* scutelliform, sessile, the *disk* concave, coloured with an inflexed margin formed of the *thallus.*

1. E. *prunastri*, thallus greenish white segments dichotomous multifid ascending linear-attenuate plane pitted, grooved and white beneath, apothecia bright brown concave. *Ach. Syn. Lich. p.* 245. *Lichen prunastri, Lightf. p.* 835. *E. B. t.* 859, and 1353 (*Lichen stictoceros*).

HAB. Branches of trees, common.

SECT. III. CEPHALOIDEI. *Apothecia subglobose, terminal on the branches or Podetia of the thallus, or scattered, sessile, immarginate.*

A. *Apothecia covered by the mass of fructification.*

24. CENOMYCE.

Universal receptacle crustaceo-cartilaginous, foliaceous, laciniated, subimbricated, free (rarely adnate, uniform, or wanting), producing subfistulose, fertile and sterile *podetia*. *Partial recept.* orbicular, immarginate, at length convex, capituliform, inflated, or hollow beneath, the circumference fixed to the *thallus* or the *podetia*, terminal, coloured.

* *Thallus foliaceous. Podetia fistulose, dilated upwards, and bearing cups, or attenuated and subulate; cups closed with a membrane.* (Scyphophora.)

† *Apothecia brown or pale.*

1. C. *alcicornis*, thallus foliaceous very pale glaucous green the segments subpalmated ascending obtuse and incurved, podetia elongated turbinate all cup-bearing smooth the cups regular crenate with the margin at length leafy and proliferous, apothecia brown. *Ach. Syn. Lich. p.* 250. *Lichen alcicornis, Lightf. p.* 872. *E. B. t.* 1392.

Hab. Heaths, mountains, and rocks.

2. C. *endiviifolia*, thallus foliaceous large glaucous yellow green white beneath the segments multifid waved crenate crisped, podetia turbinate elongate mostly simple, apothecia marginal reddish brown. *Ach. Syn. Lich. p.* 2361. *Lichen endiv., E. B. t.* 2361.

Hab. Dry heathy places, *Dickson.*

3. C. *cervicornis*, thallus foliaceous glaucous green, segments erect multifid narrow repando-subdentate, podetia cylindrical short glabrous dingy at length black all of them cup-bearing, cups small regular dilated entire nearly plane proliferous from the centre, apothecia marginal sessile brownish black. *Ach. Syn. Lich. p.* 251. *Lichen cervicornis, E. B. t.* 2574.

Hab. Pentland hills, near Edinb., *Sir J. E. Smith.*

4. C. *pyxidata*, thallus foliaceous, segments crenulated ascending, podetia all turbinate elongate cup-shaped glabrous at length granulated warty rough greyish green, cups regular the margin at length proliferous, apothecia brown. *Ach. Syn. Lich. p.* 252. *Lichen pyxidatus, Lightf. p.* 469. *E. B. t.* 1393.

Hab. Heaths, banks and rocks, and roots of old trees, abundant. Employed by the poor sometimes in the cure of the hooping cough.

5. C. *fimbriata*, thallus foliaceous the segments small crenate, podetia elongate cylindrical cup-bearing sometimes subulate slightly pulverulent white, cups regular their margins entire and crenated at length proliferous, apothecia brown. *Ach. Syn. Lich. p.* 254. *Lichen fimbriatus, Lightf. p.* 870. *E. B. t.* 2438.

η. *cornuta*, podetia elongate subulate simple or branched pulverulent white sterile or with reddish apothecia. *Lichen cornutus, Lightf. p.* 875. *E. B. t.* 1836.

Hab. Moors and heaths, *Lightf.* Near Edinb., *Sir James E. Smith.*

Milngavie, near Glasg., *Hopk.*—η. Moors and heaths, *Lightf.*, *Hopk.*

6. C. *anomæa*, thallus foliaceous ash-coloured brittle, segments imbricated minute crenate, podetia cylindrical rough and foliaceous, cups turbinate closed at length dilated and radiated, apothecia marginal sessile or stalked brownish black. *E. B. t.* 1867 (*Lichen anom.*). *Cenomyce gonorega, γ. anomæa, Ach. Syn. Lich. p.* 259.

Hab. Pentland hills, near Edinb., *Sir James E. Smith.*

7. C. *gracilis*, thallus foliaceous very minute, podetia elongate subulate sterile and cup-bearing smooth greenish brown, cups toothed at the margin at length proliferous, apothecia brown. *E. B. t.* 1264, and *Lightf. p.* 873 (*Lichen gracilis*). *Cenomyce ecmocyna α. gracilis, Ach. Syn. Lich. p.* 261.

Hab. Heaths and mountains, frequent.

†† *Apothecia scarlet.*

8. C. *filiformis*, thallus foliaceous small, segments inciso-lobate crenate, podetia cylindrical simple and somewhat branched at the extremity greenish white granulated rarely cup-bearing, cups narrow at length radiating, apothecia minute scarlet. *Ach. Syn. Lich. p.* 266 (*C. bacillaris*). *Lichen filiformis, E. B. t.* 2028. *L. tubiformis, Lightf. p.* 871.

Hab. Woods, heaths, and the roots of old trees, *Lightf.*

9. C. *digitata*, thallus foliaceous small, segments expanded rounded crenate beneath as well as on the cylindrical yellow-green cup-bearing podetia pulverulent, cups narrow small at length large with the often branched numerous digitate or rayed prolifications tipped with the bright scarlet apothecia. *Ach. Syn. Lich. p.* 267. *Lichen digitatus, Lightf. p.* 874. *E. B. t.* 2439.

Hab. Woods, at the roots of old trees, and on barren heaths.

10. C. *deformis*, thallus foliaceous minute segments broadish cut crenate naked beneath, podetia long thick subventricose sulphur-coloured slightly pulverulent cup-bearing, cups narrow crenato-dentate at length dilated and jagged, apothecia sessile and pedunculate scarlet. *Ach. Syn. Lich. p.* 268. *Lichen def., Lightf. p.* 876. *E. B. t.* 1394.

Hab. Roots of old trees and in woods, but not common, *Lightf.*

11. C. *coccifera*, thallus foliaceous minute the segments rounded crenate naked beneath, podetia elongated turbinate naked nearly pale yellow or greyish green all cup-bearing, cups with their margins spreading fertile, apothecia large at length stalked scarlet. *Ach. Syn. Lich. p.* 269. *Lichen cocciferus, Lightf. p.* 866. *E. B. t.* 2051.

β. *cornucopioides*, podetia rather short cup-bearing, cups dilated crisped and foliaceous terminated by the scarlet stalked apothecia at length proliferous. *Lichen cornucopioides, Lightf. p.* 868.

HAB. Moors and heaths, frequent. β. mixed with α.

12. C. *bellidiflora*, thallus foliaceous minute the segments inciso-crenate naked beneath, podetia elongate cylindrical rigid glabrous foliaceo-squamose pale all cup-bearing, cups narrow their margins fertile and proliferous, apothecia crowded scarlet. *Ach. Syn. Lich p.* 270. *Lichen bellid., E. B. t.* 1894.

HAB. Ben Nevis, Ben Lawers, Ben Lomond, and probably most of the lofty Highland mountains.

** *Thallus foliaceous. Podetia fistulose, dilated, and cup-bearing upwards; cups pervious.* (Schasmaria.)

13. C. *sparassa*, thallus foliaceous minute lobed and crenated, podetia elongated branched subventricose granulated rough with leafy scales cup-bearing, cups irregular pervious dentato-radiate proliferous, apothecia stalked pale brown. *Ach. Syn. Lich. p.* 273. *Lichen sparassus, E. B. t.* 273. *L. ventricosus, Lightf. p.* 875.

HAB. In woods upon the decayed stumps of old trees, but not common, *Lightf.*

*** *Thallus foliaceous, or scarcely any. Podetia cartilaginous, rigid, fistulose, all attenuated, subulate, and branched, their axils generally perforated.* (Cladonia.)

14. C. *racemosa*, podetia elongated smooth at length scaly greenish white inflated curved branched, branches lax subsecund their extremities divergent spinulose, apothecia pale brown. *Ach. Syn. Lich. p.* 275. *Lichen spinosus, Lightf. p.* 882. *Dill. Musc. t.* 16. *f.* 25.

HAB. Heaths and mountainous places, but not very common, as upon the Pentland hills, *Lightf.*

15. C. *furcata*, podetia elongated smooth livid brown dichotomous, axils not perforated, branches narrow subulate curved the extremities forked divergent, fertile ones with brown apothecia. *Ach. Syn. Lich. p.* 276. *Lichen furcatus, Lightf. p.* 881. *Dill. Musc. t.* 16. *f.* 27. A—D.

β. *subulata*, podetia elongate slender sparingly branched, branches nearly erect, fertile branches with brown capitate apothecia. *Ach. Syn. Lich. p.* 276. *Lichen subulatus, Lightf. p.* 881. *Dill. Musc. t.* 16. *f.* 21. A. B.

HAB. Woods, heaths, and mountainous places, frequent, *Lightf.*

16. C. *uncialis*, podetia elongate glabrous pale dichotomous the axils perforated open, extremities of the branches patent short acute and rigid, apothecia small terminal brown. *Ach. Syn. Lich. p.* 276. *Lichen uncialis, Lightf. p.* 880. *E. B. t.* 174.

β. *adunca*, podetia pale or hoary dichotomously branched, the axils perforated, extremities of the branches radiated uncinatospinose, apothecia capitate pale brown. *Ach. Syn. Lich. p.* 277. *Lichen uncialis* β. *Lightf. p.* 880. *Dill. Musc. t.* 16. *f.* 21. A. B.

HAB. On moors and heaths, frequent.

17. C. ***rangiferina***, podetia elongate cylindrical erect roughish hoary branched, axils often perforated, branches scattered very much divided spreading the ultimate ones subradiate or drooping, apothecia subglobose clustered brown. *Ach. Syn. Lich. p.* 277. *Lichen rangiferinus, Lightf. p.* 877. *E. B. t.* 277.

HAB. Woods, heaths and mountains, abundant.

This is the Lichen which, for the greater part of the year, and especially in winter, is the support of the vast herds of rein-deer, in which consists all the wealth of the Laplanders. No vegetable, Linnæus tells us, grows throughout Lapland in such abundance as this, especially in woods of scattered pines, where, for very many miles together, the surface of the sterile soil is covered with it as with snow. On the destruction of forests by fire, when no other plant will find nutriment, this Lichen springs up and flourishes, and, after a few years, acquires its greatest size. Here the rein-deer are pastured: and, whatever may be the depth of snow during the long winters of that climate, they have the power of penetrating it and obtaining their necessary food. Linnæus has given a beautiful description of this Lichen, and of the animals whose support it is, in the *Flora Lapponica*, p. 332, which is too long for insertion in this place.

**** *Thallus none. Podetia soft, subsolid, subulate, but little branched (sterile), the axils not perforated.* (Cerania.)

18. C.? ***vermicularis***, podetia subulate nearly simple smooth very white subfistulose flexuose prostrate. *Ach. Syn. Lich. p.* 278. *Lichen vermic., E. B. t.* 2029.

HAB. Ben Nevis, Ben Lawers, and probably most of the lofty Highland mountains, *Mr. Turner* and *Hook.* Discovered in Scotland by Mr. Dickson, but he has given no particular station for it.

25. BÆOMYCES.

Universal receptacle crustaceous, spreading, plane, adnate, producing soft, solid, fertile *podetia*. *Partial recept.* capituliform, immarginate, solid, terminal, sessile upon the *podetia*, coloured.

1. B. ***roseus***, crust uniform granulated greenish white, podetia very short cylindrical, apothecia subglobose wrinkled pale flesh-colour. *Ach. Syn. Lich. p.* 280. *Lichen ericetorum, Lightf. p.* 809 (exclusive of the var. β). *E. B. t.* 374.

HAB. Upon the ground in heaths, banks, &c., in a sandy soil.

2. B. ***rufus***, crust uniform rugose granulated and pulverulent greenish white, podetia very short somewhat compressed, apo-

thecia flattish at the top sometimes conglomerate reddish brown. *Ach. Syn. Lich. p.* 280. *Lichen byssoides, Lightf. p.* 809. *E. B. t.* 373.

Hab. Rocks, old walls and sometimes upon the ground, *Lightf.*

26. ISIDIUM.

Universal receptacle crustaceous, spreading, plane, adnate, uniform, bearing solid, shortish *podetia*. *Partial recept.* orbicular, convex, at length subglobose, solid, terminal upon the *podetia* and more or less sunk into their extremity, so as to leave a margin formed of the substance of the *podetium*.

1. I. *corallinum*, crust tartareous greyish white, podetia at length elongated rounded simple or branched, apothecia brownish grey. *Ach. Syn. Lich. p.* 281. *Lichen corallinus, Lightf. p.* 808. *E. B. t.* 1541.

Hab. Rocks in the Highlands, not unfrequent, as about Finlarig, in Breadalbane, *Dr. Stuart.* Dumfries-shire, *Dr. Burgess.* Blackford, near Edinburgh, *Sir James Edward Smith.* Ascent and top of Ben Lomond, *Mr. Turner* and *Hook.* Pentland hills, *Maugh.*

Podetia small, not ¼ of an inch high, much crowded and of a brittle or stony substance, whitish.

2. I. *Westringii*, crust tartareous thin unequal cracked and greyish, podetia subglobose at length cylindrical simple and branched, apothecia dark brown. *Ach. Syn. Lich. p.* 282. *Lichen Westringii, E. B. t.* 2204.

Hab. Rocks among the mountains, *Dicks.*

3. I. *microsticticum*, crust tartareous cracked smoothish nearly even of a brownish cream-colour thinner towards the edges, podetia scattered short hemisphærical simple of the same colour as the crust, apothecia brownish. *Turn.* and *Borr. Lichenogr. Brit. inedit. p.* 94. *Lichen microsticticus, E. B. t.* 2213.

Hab. Rocks in Scotland, *Dickson, Dr. Stuart.*

27. STEREOCAULON.

Universal receptacle cartilaginous or somewhat woody, branched and shrubby. *Partial recept.* turbinate, sessile, solid, plane, scarcely rising above a margin formed by the *thallus*, at length hemisphærico-globose, dilated, reflexed below and covering the margin.

1. S. *paschale*, thallus greyish branched and rough with granulated excrescences, branches crowded and very much divided, apothecia scattered and terminal at length convex conglomerate blackish brown. *Ach. Syn. Lich. p.* 284. *Lichen paschalis, Lightf. p.* 886. *E. B. t.* 282.

Hab. Rocks on the Highland mountains, abundant. Corstorphine and Pentland hills, near Edinb., *G. Don,* and *Mr. E. J. Maughan.*

B. *Apothecia covered by the substance of the thallus, containing a pulverulent mass.*

28. SPHÆROPHORON.

Universal receptacle crustaceo-cartilaginous, branched, shrubby, solid within. *Partial recept.* subglobose, sessile, terminal on the branches of the *thallus* and formed of it, breaking with a torn margin and containing within a pulverulent (black) mass collected into a ball.

1. S. *coralloides*, thallus palish brown, branches lateral elongated lax divaricated and forked acuminated, apothecia subglobose, smooth. *Ach. Syn. Lich. p.* 267. *Lichen globiferus*, *Lightf. p.* 887. *E. B. t.* 115.

HAB. Rocks in the Highlands and Lowlands, frequent.

2. S. *fragile*, thallus greyish branched, branches dichotomous short crowded fastigiate naked rounded rather obtuse, apothecia globoso-turbinate somewhat warted. *Ach. Syn. Lich. p.* 287. *Lichen fragilis*, *Lightf. p.* 888. *E. B. t.* 2474 (*not* 114, *which is the following*).

HAB. Rocks in mountainous places, frequent.

3. S. *compressum*, thallus whitish branched, branches compressed ramulose subfibrillose naked, apothecia subglobose depressed and smooth above. *Ach. Syn. Lich. p.* 237. *Lichen fragilis*, *E. B. t.* 114.

HAB. Rocks in mountainous places, but mostly sterile.

DIV. III. HOMOTHALAMI. *Lichens whose apothecia are formed wholly of the substance of the thallus and of the same colour with it.*

29. ALECTORIA.

Universal receptacle cartilaginous, subfiliform, branched, prostrate or pendulous, within somewhat fistulose and with a central thread. *Partial recept.* scutelliform, thick, sessile, plane or convex, margined, entirely formed of the *thallus*, and of the same colour.

1. A. *jubata*, thallus rounded somewhat shining livid brown very much branched, branches filiform compressed at the axils, apothecia of the same colour at length convex entire at the margin. *Ach. Syn. Lich. p.* 291. *Lichen jubatus*, *Lightf. p.* 891. *E. B. t.* 1880.

β. *chalybeiformis*, thallus and the subsimple branches flexuose or tortuose complicated rather rigid greyish black decumbent. *Ach. Syn. Lich. p.* 291. *E. B. t.* 1880. *L. chalybeiformis*, *Lightf. p.* 892.

HAB. Trunks of trees, especially firs, and rocks, frequent.

This, Linnæus tells us, occasionally supplies the rein-deer with food;

for which purpose the Laplanders cut down the trees that the Lichen may be devoured from the topmost branches.

2. A. *sarmentosa*, thallus roundish angular somewhat pitted dichotomous pale yellowish, the extremities much branched lax and slender, apothecia rather concave livid pruinose at length flattened. *Ach. Syn. Lich. p.* 293. *Lichen sarmentosus, E. B. t.* 2040.

HAB. Cairn-gorum, near the summit upon rocks, *Hook.* Ben Luyhal, in Sutherland, on the ground on the summit, *Mr. Borrer* and *Hook.*

30. RAMALINA.

Universal receptacle cartilaginous, with a central solid thread within, branched and laciniated, somewhat shrubby, generally bearing warts. *Partial recept.* scutelliform, thickish, pedicellate and subpeltate, plane, margined, entirely formed of the *thallus*, and nearly of the same colour.

1. R. *fraxinea*, thallus plane linear laciniated greyish white glabrous but rugose and pitted subreticulated the ultimate branches attenuated, apothecia mostly marginal plane pale-flesh coloured. *Ach. Syn. Lich. p.* 296. *Lichen fraxineus, Lightf. p.* 835. *E. B. t.* 1781.

HAB. Trunks and branches of trees, particularly oaks and ashes, frequent.

A variable species, especially in the breadth and ramifications of the *thallus*.

2. R. *fastigiata*, thallus compressed glabrous pitted branched glaucous white, branches thickened and fastigiated upwards, apothecia numerous terminal peltate subsessile white. *Ach. Syn. Lich. p.* 296. *Lichen fastig., E. B. t.* 890.

β. *calicaris*, thallus and branches elongated, branchlets cylindrical attenuated pitted and channelled, apothecia subterminal appendiculated beneath. *Ach. Syn. Lich. p.* 297. *Lichen calicaris, Lightf. p.* 834.

HAB. Rocks and trees.

3. R. *scopulorum*, thallus compressed glabrous somewhat pitted branched yellowish grey, branches linear attenuated, apothecia scattered on short stalks of the same colour as the thallus. *Ach. Syn. Lich. p.* 297. *Lichen scopulorum, E. B. t.* 688.

HAB. Rocks by the sea-coast. Most abundant on the " Standing stones of Stonhouse," in Pomona, Orkney, *Mr. Borrer* and *Hook.*

4. R. *farinacea*, thallus compressed glabrous somewhat pitted bearing powdery warts rigid branched greyish or greenish white, branches linear attenuated, apothecia scattered on short stalks plane somewhat margined whitish. *Ach. Syn. Lich. p.* 298. *Lichen farinaceus, Lightf. p.* 833. *E. B. t.* 889.

HAB. Trunks of trees, frequent, but rare in fructification.

31. CORNICULARIA.

Universal receptacle cartilaginous, with a somewhat solid thread within, branched, shrubby. *Partial recept.* orbicular, terminal, obliquely peltate, entirely formed of the substance of the *thallus*, at length convex, subinflated; the circumference somewhat margined, subdentate, at length reflexed, of a rather different colour.

1. C. *tristis*, thallus deep pitchy brown rounded or subcompressed smoothish distichously dichotomous, branches fastigiate black above, apothecia plano-convex blackish brown somewhat marginated entire and toothed. *Ach. Syn. Lich. p.* 299. *Lichen tristis, E. B. t.* 720. *L. corniculatus, Lightf. p.* 885.

Hab. Alpine rocks, frequent.

2. C. *aculeata*, thallus glabrous chesnut brown roundish angular pitted and subcompressed naked, branches and branchlets divaricated flexuose aculeated, apothecia reddish brown, the circumference somewhat toothed. *Ach. Syn. Lich. p.* 299.

β. *spadicea*, thallus glabrous chesnut coloured plano-compressed somewhat pitted with the margins denticulate, branches and branchlets short patent attenuated, apothecia spinoso-radiate reddish brown. *Lichen hispidus, Lightf. p.* 883. *E. B. t.* 452.

Hab. Highland mountains, frequent.

3. C. *bicolor*, thallus black rounded capillary suberect branched, branches fine shortish scattered patent their extremities curved greyish. *Ach. Syn. Lich. p.* 301. *Lichen bicolor, E. B. t.* 1853.

* Hab. Ben y Glow, *Mr. Dickson.* Rocks upon hills about Loch Tay, not unfrequent, *Mr. Turner* and *Hook.*

Apothecia unknown.

4. C. *ochroleuca*, thallus glabrous pale yellowish white roundish suberect branched, branches short attenuated blackish at the points, apothecia brownish pale in the circumference. *Ach. Syn. Lich. p.* 301. *Lichen ochroleuc., E. B. t.* 2374.

Hab. Highland mountains, *Dickson.*

5. C. *lanata*, thallus decumbent rounded smoothish dichotomous greyish black, branches and branchlets flexuose intricate forked at the extremity, apothecia somewhat margined plane, the circumference naked and granulated. *Ach. Syn. Lich. p.* 302. *Lichen lanatus, Lightf. p.* 892. *E. B. t.* 846.

Hab. Rocks in the Highlands and in the Lowlands.

6. C. *pubescens*, thallus decumbent rounded roughish black, branches intricate capillaceous the ultimate ones simple, apothecia of the same colour entire in the circumference. *Ach. Syn. Lich. p.* 302. *Lichen pubescens, Lightf. p.* 893. *E. B.*

t. 2313. (*excl. the Syn. of Lich. exilis Lightf.*) *Conferva atrovirens, Dillw. Conf. t.* 25. *Scytonema atro-virens, Agardh Disp. Alg. Suec. p.* 39.

Hab. Rocks, on the Highland mountains, not unfrequent.

32. USNEA.

Universal receptacle subcrustaceous, rounded, branched, generally pendulous, having in the centre an elastic thread. *Partial recept.* orbicular, terminal, peltate, entirely formed of the substance of the thallus and nearly of the same colour, the circumference without a margin and generally ciliated.

1. U. *florida*, thallus nearly erect roughish greenish grey with very numerous fine horizontal fibres, branches patent subsimple, apothecia plane very broad whitish ciliated, the ciliæ radiating long. *Ach. Syn. Lich. p.* 304. *Lichen floridus, Lightf. p.* 897. *E. B. t.* 872.

Hab. Branches of old trees, not very uncommon, *Lightf.*

2. U. *plicata*, thallus pendulous smooth pale, branches lax much divided subfibrillose the ultimate ones capillaceous, apothecia plane broad ciliated, ciliæ slender very long. *Ach. Syn. Lich. p.* 305. *Lichen plicatus, Lightf. p.* 889. *E. B. t.* 257.

β. *hirta*, thallus nearly erect somewhat shrubby pale greenish white very much branched subpulverulent and roughish, branches very much divided flexuose intricate attenuated subfibrillose. *Ach. Syn. Lich. p.* 305. *Lichen hirtus, Lightf. p.* 895. *E. B. t.* 1354.

Hab. α. On the branches of old trees, but not common. In the Barntimpen Linn, in the parish of Kirkpatrick, Dumfries-shire, *Dr. Burgess.* β. Upon old trees and in hedges, frequent, *Lightf.*

3. U. *barbata*, thallus pendulous smoothish rounded thickish pale greenish grey, branches divergent here and there fibrillose capillary at their extremity articulated below. *Ach. Syn. Lich. p.* 306. *Lichen barbatus, Lightf. p.* 890. *Lichen articulatus,* β. *E. B. t.* 258. *f.* 2.

β. *articulata*, thallus glabrous greenish grey glabrous, branches elongate dichotomously divided articulated, articulations swelling distinct, ultimate branches capillary fibrillose. *Lichen articulatus,* α. *E. B. t.* 258.

Hab. Branches of old trees in thick woods and pine-forests.

33. COLLEMA.

Universal receptacle entirely of one substance, sub-gelatinous, which in drying generally becomes hard and cartilaginous, polymorphous (crustæform, foliaceous or branched). *Partial recept.* scutelliform, sessile (rarely subpedicellate), margined, entirely formed of the substance of the *thallus;* the *disk* of the same colour, rarely (in drying) coloured.

* *Thallus imbricated, plicated, suborbicular, composed of minute lobes (when moist, thick and turgid).* (Euchylium.)

1. C. *cheileum*, thallus suborbicular imbricated, lobes thick all minute rounded crenulated ascending, apothecia nearly plane aggregated of the same colour as the thallus the margin crenulated subevanescent. *Ach. Syn. Lich. p.* 310. *Lichen marginatus, Bernh. in Schrad. Journ.* 1799, *v.* 1. *p.* 6. *t.* 1. *f.* 2. a. *Dicks. Crypt. fasc.* 4. *p.* 25.

HAB. Roots of trees in shady subalpine woods, *Dickson.*

2. C. *melænum*, thallus orbicular somewhat stellated imbricated, lobes cut and laciniated their margins elevated waved crisped and crenulated, apothecia marginal nearly plane of the same colour with the thallus their margin granulated. *Ach. Syn. Lich. p.* 315.

β. *marginale*, lobes of the thallus deeply laciniated narrow multifid spreading flexuose nearly plane crenate and lobed, apothecia marginal and scattered dark brown their margin entire. *Ach. Syn. Lich. p.* 316. *Lichen marginalis, E. B. t.* 1924.

HAB. β. Highlands of Scotland, *Sir J. E. Smith*, in *E. B.*

3. C. *fasciculare*, thallus suborbicular imbricato-plicate, plaits central erect flexuose, lobes of the circumference rounded inciso-crenate, apothecia marginal turbinate fasciculate, disk rather convex reddish. *Ach. Syn. Lich. p.* 317. *Lichen fascic.*, *Lightf. p.* 841. *E. B. t.* 1162.

HAB. Shady places on the north sides of trunks of trees, not unfrequent, particularly on the ash, *Dr. Burgess.* Wood between Ballacheulish and Linnhe Loch, *Mr. Turner* and *Hook.*

** *Thallus foliaceous; lobes rounded, downy or fibrillose beneath.* (Mailotium.)

4. C. *saturninum*, thallus foliaceous blackish green glaucous and downy beneath, lobes rounded waved entire, apothecia scattered elevated plane reddish their margin entire. *Ach. Syn. Lich. p.* 320. *Lichen saturninus, E. B. t.* 1980.

HAB. Trunks of trees, *Dickson.*

5. C. *Burgessii*, thallus foliaceous somewhat imbricated glaucous greenish brown pubescent and somewhat spongy beneath, lobes rounded sinuated crenulated and crisped, apothecia depressed planish brown their margin foliaceous crisped. *Ach. Syn. Lich. p.* 320. *Lichen Burgessii, Lightf. p.* 827. *E. B. t.* 300.

HAB. Discovered upon trunks of hazel and birch in Dumfries-shire by *Dr. Burgess.* Plentiful on trees by the side of Loch Lomond, going to Tarbet; and near Inverary and Ballacheulish, *Mr. Turner* and *Hook.*

*** *Thallus foliaceous; lobes submembranaceous, lax, naked, blackish green.* (Lathagrium).

6. C. *nigrescens*, thallus foliaceous membranaceous submonophyllous orbicular depressed plaited rounded and lobed black-

green, apothecia central crowded at length convex reddish brown their margin entire. *Ach. Syn. Lich. p.* 321. *Lichen nigrescens, E. B. t.* 345. *L. Vespertilio, Lightf. p.* 840.

Hab. Trunks of trees, not uncommon.

7. C. *flaccidum*, thallus foliaceous membranaceous smooth blackish green, lobes distinct rounded entire lax waved, apothecia scattered nearly plane reddish, their margin thin entire. *Ach. Syn. Lich. p.* 322. *Lichen flaccidus, E. B. t.* 1653.

Hab. Received from Scotland by *Mr. Dickson. Sm.* in *E. B.*

8. C. *furvum*, thallus foliaceous membranaceous somewhat wrinkled complicate blackish green granulated on both sides, lobes rounded unequal waved and crisped entire, apothecia scattered plane dark brown their margin entire. *Ach. Syn. Lich. p.* 323. *Lichen granulatus, E. B. t.* 1737.

Hab. Trunks of trees, rocks, &c.; mentioned by *Lightf.* as a var. of C. *nigrescens.*

**** *Thallus foliaceous; lobes rounded, membranaceous, thin, naked, glaucous grey, subdiaphanous. Apothecia subpedicellate.* (Leptogium.)

9. C. *tremelloides*, thallus foliaceous membranaceous thin subdiaphanous lead-colour obsoletely rugose and dotted, lobes rounded somewhat cut, apothecia scattered subpedicellate plane reddish brown their margin pale. *Ach. Syn. Lich. p.* 326. *Lichen tremell., E. B. t.* 1981. *L. cochleatus, Dicks. Crypt. fasc.* 1. *t.* 2. *f.* 9.

Hab. East side of the rock of Dumbarton Castle, *Sir J. E. Smith.* Upon rocks among moss, at Aros, Isle of Mull, plentiful, *Mr. Turner* and *Hook.*

10. C. *lacerum*, thallus nearly erect foliaceous membranaceous subdiaphanous subrugose with obscure reticulations glaucous, lobes small subimbricated cut and laciniated and somewhat fringed, apothecia scattered rather concave red their margin pale. *Ach. Syn. Lich. p.* 327. *Lichen lacer, E. B. t.* 1982. *L. tremelloides, Lightf. p.* 842.

Hab. Common on the ground among mosses, *Lightf.*

***** *Thallus very slender, laciniated and branched.* (Polychidium).

11. C. *subtile*, thallus substellate the segments very narrow linear appressed very much branched obtuse, apothecia central nearly plane of the same colour as the crust their margin thin entire. *Ach. Syn. Lich. p.* 328. *Lichen subtilis, E. B. t.* 1008.

Hab. Scotland, not unfrequent, *Mr. Brown.*

12. C. *muscicola*, thallus pulvinate brown, branches rounded nearly erect flexuose uneven subfastigiate rather obtuse, apothecia nearly terminal plane brown margined. *Ach. Syn. Lich. p.* 328. *Lichen muscicola, E. B. t.* 2264.

Hab. Rocks among mosses in the Highlands, *Dickson.*

Div. IV. Athalami. *Lichens which have no apothecia, or whose fructification we are not acquainted with.*

34. LEPRARIA.

Universal receptacle a pulverulent spreading adnate uniform crust, rarely mixed with fibres, or filmy at the base. *Partial receptacle* none?

1. L. *chlorina*, crust thick pulvinate bright sulphur-colour composed of a dust-like substance collected into somewhat hairy globules. *Ach. Syn. Lich. p.* 330. *E. B. t.* 2038.

Hab. Scotland, *Mr. Dickson*, in *E. B.* On rocks behind the inn at Aviemore, in Strathspey, *Mr. Borrer* and *Hook.*

2. L. *flava*, crust spreading equal thin somewhat cracked bright yellow composed of subglobose granules. *Ach. Syn. Lich. p.* 330. *E. B. t.* 1350. *Byssus candelaris, Lightf. p.* 1005.

Hab. Old pales, the bark of trees and wood of houses, common.

3. L. *Jolithus*, crust spreading equal thin red composed of subglobose minute granules. *E. B. t.* 2471. *Turn.* & *Borr. Lich. Brit. ined. p.* 19. *Byssus Jolithus, Linn.*

Hab. Rocks in damp shady situations at Luss, *Mr. Turner* and *Hook.*

This diffuses at all times, even when dry, a faint violet-like smell, which, together with its red colour, suffices to distinguish it. It is this which tinges the stones at Holywell, in Flintshire, and there is a superstitious notion that they are sprinkled with the blood of St. Winifred.

4. L. *æruginosa*, light verdigrise green, crust minutely fibrous branched covered with numerous minute clustered granules. *E. B. t.* 2182. *Byssus æruginosa, Huds. Angl.* (*according to Sm.*) *Conferva pulveria, Dillw. Conf. p.* 78 *of the Synopsis, t.* D. *Suppl.*

Hab. Pillars of Rosslyn Chapel, *Sir Jas. E. Smith.*

5. L. *latebrarum*, grey, crust fibrous forming dense cushions, granules in small round clusters. *Ach. Syn. Lich. p.* 331. *E. B. t.* 2147.

Hab. Rock at the Hermitage at Blackford, as well as on several rocks in Rivelston Wood, *Smith.*

Appears in its *structure*, from the *E. B.* figure, exactly to resemble the former species.

6. L. *botryoides*, crust thin spreading granulato-pulverulent green somewhat gelatinous, granules collected into a somewhat beaded form and clustered. *Ach. Syn. Lich. p.* 331. *E. B. t.* 2148, *Byssus botryoides, Lightf. p.* 1006.

Hab. Trunks of trees, posts, rails, &c. in shady situations, abundant.

7. L. *nigra*, crust filmy greyish granulated in patches, granules extremely minute in thin even layers quite black. *Turn.* & *Borr. Lich. Brit. ined. p.* 21. *E. B. t.* 2409.

Hab. On the flat tops of gateposts, frequent, *Hopk.*

ORDER III. ALGÆ[a].

Vegetables for the most part aquatics, destitute of *roots*, or furnished only with a fibrous or scutate base for the purpose of attachment merely; whose *fronds* are either gelatinous, filamentose, membranous, or coriaceous, having, for fructification, *seeds* or *sporules*, either imbedded in *tubercles* or processes arising from the *frond*, or immersed and more or less scattered in the substance of the *frond* itself.

Many species of this singular, and, generally speaking, beautiful order of plants, frequently float in the water without any point of attachment to extraneous substances. They are mostly subpellucid, and the cellules are often elongated and united so as to form fibres interrupted by transverse dissepiments. Their colour is various, often green, brown, red, &c. After having been kept dry for a great length of time, they will revive by immersion in water, but that portion of the plant only imbibes the fluid which is immersed in it.

DIV. I. TREMELLINÆ. *Frond gelatinous of a determined figure, containing within conferva-like or beaded filaments.—Root none. Frond either globose or palmate, or filiform, consisting of a gelatinous, pellucid substance, in which are imbedded clustered, conferva-like, jointed, branched, or simple filaments. Fructif. either interior, included in the joints of the filaments, or rarely exterior in capsules. Colour generally green, sometimes brown or purplish.*

1. NOSTOC.

Filaments moniliform, composed of united globules. *Frond* olivaceous, between gelatinous and coriaceous, bullate, hollow, at length spreading, filled with moniliform, simple, curved, and crisped filaments. According to Vaucher, these plants propagate by the globules of which the filaments are composed, which, by degrees, separate and grow into new individuals.

1. N. *commune*, upon the ground, frond lobed and plicate bullate gelatinous olive green. *Ag. p.* 133. *Tremella Nostoc, Lightf. p.* 898. *E. B. t.* 461.

HAB. Gravelly walks and pastures after rain, frequent, *Lightf.*, *Hopk.*

2. N. *verrucosum*, frond bladdery subcoriaceous hollow plicate and smooth. *Ag. p.* 132. *Tremella verrucosa, Lightf. p.* 899.

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[a] In this order I follow and adopt the ordinal and generic characters, with few exceptions, of *Agardh*, in his *Synopsis Algarum Scandinaviæ*, Lund. 1817.

Hab. Rocks in the Highland rivulets, near the foot of the mountains, frequent, *Lightf.*

Frond oval, an inch or more in diameter, olive green, gelatinoso-coriaceous, plicato-lobate, smooth, at length spreading into an ulva-like membrane, 4—5 inches in diameter. *Filaments* flexuose, compact and intricate, nearly equal at first, at length moniliform. *Ag.*

2. ALCYONIDIUM. *Lamour.*

Capsules graniferous, imbedded in a fleshy or gelatinous substance. *Frond* subcylindrical, lobed; substance between spongy and gelatinous.

1. A. *diaphanum*, subgelatinous pale yellowish pellucid somewhat cylindrical with numerous branches and lobes of various sizes. *Ag. p.* 131. *Ulva diaphana, E. B. t.* 263. *Alcyonium gelatinosum, Linn.*

Hab. Cast on shore in the Orkney islands, *Mr. P. Neill.*

Has very much the appearance of animal substance.

3. RIVULARIA.

Filaments arising from a common base, continuous, annulated within, of an olive or dark green colour, globular.—*Filaments* (resembling those of *Oscillatoria*) simple, continuous, annulated within, having a globule at one extremity, at the other terminating in a long diaphanous point. Their mode of increase is hitherto unknown.

1. R. ? *tuberiformis*, frond irregularly globose inflated folded olivaceous brown smooth, globules of the filaments in the external surface of the frond. *E. B. t.* 1956. *Tremella difformis, Lightf. p.* 900.

Hab. On *Confervæ* and other marine substances, and on the rocks at low water, *Lightf.* Abundant at Ulva, Staffa, and Iona, in such situations.

An inch or more in diameter, coriaceo-gelatinous, hollow. The *filaments* tapering from the globular extremity, which is in the surface, internally, to long attenuated points.

2. R. *atra*, fronds hemisphærical solitary hard shining blackish green, filaments densely crowded fasciculated at the base pellucid green. *Ag. p.* 130. *E. B. t.* 1798. *Tremella hemisphærica, Linn., Lightf. p.* 900.

Hab. Marine rocks, not uncommon.

Minute, appearing black.

4. CHÆTOPHORA.

Filaments arising from a common base, jointed. *Gemmæ* scattered among the mass of the frond.—*Frond* very gelatinous, palmate, globose, or filiform. *Filaments* (like those of a *Conferva*) branched, jointed, gradually tapering, produced beyond the surface of the *frond*, into long, diaphanous points. *Gem-*

mæ scattered within the *frond*, hard, thicker than the *filaments*, and producing new individuals. *Colour* light green, brown, or purplish.

* *Filiform. Filaments from the axis of the frond.*

1. C.? *vermiculata*, "cylindrical much branched brown, branches scattered subdivided crooked, internal filaments compound and divaricated their ultimate branches clustered beaded thickened upwards, fruit (gemmæ?) sessile at the base of the beaded branches." *E. B. t.* 1818 (*Rivularia vermiculata*).

Hab. On rocks in the sea; Berriedale in Caithness, and at Losiemouth, on the coast of Morayshire, *Mr. Borrer* and *Hook.*

2. C. *multifida*, frond rounded filiform solid repeatedly dichotomous, the branches elongated divaricated, filaments within the substance dichotomous very much branched, branchlets fastigiate straight torulose blackish purple. *Rivularia multifida, Roth, Cat. Bot. t.* 3. *p.* 335. *Ulva rubra, E. B. t.* 1627? *Chætophora rubra, Ag. p.* 127.

Hab. Coast of Moray, on rocks in the sea, *Mr. Borrer* and *Hook.*

Colour purple. Can this be the younger state of *R. vermiculata?* If so, the present name should be retained.

** *Filaments arising from the base of the fronds.*

3. C. *endiviæfolia*, frond compressed much branched; branches lobed obtuse, filaments parallel branched at the extremity in a fastigiated manner. *Ag. p.* 129. *Ulva incrassata, E. B. t.* 967.

Hab. In pools of fresh water near Brodie-house, by Forres, *Hook.*

One inch long, very soft and gelatinous, pale green, attached to sticks, mosses, &c., in the water.

4. C. *tuberculosa*, frond globose hollow, granules numerous scattered through the mass and emitting filaments. *Ag. p.* 129. *Rivularia tuberculosa, E. B. t.* 2366.

Hab. Ditches and lochs (fresh water), occasionally. In a ditch leading into Frankfield Loch; and in a well near Clyde Iron-works, Glasgow, *Hopk.* Rivulet near Edinb., *Mr. Greville.*

From a quarter to half an inch in diameter, palish green, wrinkled, but very soft. *Filaments* much branched, diaphanous at the points.

Div. II. Confervoideæ. *Fruit, either naked granules included in the frond, or capsules. Frond tubular, internally or externally jointed. Substance membranous. Root generally none. Fronds either affixed by their base, or floating, free, tubular, filiform or capillary, jointed; joints sometimes annuliform, sometimes external, sometimes internal (as in Oscillatoria and Scytonema), simple or branched. The articulations various in length, full of a coloured matter, generally either* *purple or green. They propagate by various means, either by granules, which fall out on the bursting of the filaments, or, after the union of two filaments by the granules of two articulations collecting into one; or, by an articulation giving origin to a new individual, and, as it were, viviparous; or, by seeds included in a capsule or immersed in gelatine.*

5. DRAPARNALDIA.

Frond gelatinous. *Primary filaments* jointed, with penicellate branchlets. *Granules* internal.—*Fronds* very gelatinous, and formed of conferva-like *filaments* of two kinds, of which one is penicelliform, and, as it were, parasitic on the other more simple one. The *primary filaments* are equal, jointed; the *articulations* pellucid, marked with a green transverse zone. *Secondary filaments* in pencil-shaped fascicles, with short *articulations* scarcely distinct, terminated by a long, acuminated, pellucid point. *Fruit;* none external, but the species are propagated by *granules* included in the *articulations*. They have a most elegant appearance on paper, resembling a beautiful drawing, and adhere firmly by their own tenacity.

1. D. *glomerata*, pencils of branchlets ovate obtuse patent. *Ag. p.* 124. *Batrachospermum glomeratum, Vauch. Conf. t.* 12. *f.* 1. *Conferva mutabilis, E. B. t.* 1746.

HAB. Margins of lakes, clear ditches, and streamlets, attached to stones and aquatic plants.

Very gelatinous; in tufts of 2 or 3 inches in length. *Primary branches* pellucid, rather thick; *secondary ones* small, much pencilled, with the *branchlets* spreading, in which respect it differs principally from the following.

2. D. *plumosa*, pencils of the branchlets lanceolate acute erect. *Ag. p.* 124. *Batrachospermum plumosum, Vauch. Conf. t.* 11. *f.* 2. *Conferva mutabilis, Dillw. Conf. t.* 12.

HAB. The same situations as the last.

6. BATRACHOSPERMUM.

Frond gelatinous. *Primary filaments* jointed, branchlets verticillate. *Gemmæ* external. *Fronds* very gelatinous, branched, often moniliform, composed of *filaments* of two kinds. The *primary ones* resembling the more simple *Confervæ*, jointed, equal; and *filaments* or *branchlets* arising from their joints, whorled, divided, moniliform. *Fruit; gemmæ?* or *seeds*, external among the *branchlets*.

1. B. *moniliforme*, frond alternately branched moniliform, branches attenuated. *Ag. p.* 122. *Batrachospermum moniliforme, Vauch. Conf. t.* 1. *f.* 5. *t.* 11. *f.* 1 and 3. *E. B. t.* 689. *Dillw. Conf. t.* 32.

HAB. Clear running streams, not uncommon.

Very lubricous, but varying excessively in the size and colour of the whorled *branchlets*. Most frequently purple, sometimes dark or blue green, or even blue. The *Conf. nigra* of *Dillw.* and *E. B.* is now, I believe, generally acknowledged to be only a state of this on which the *branchlets* have been destroyed.

7. GLOIONEMA.

Filaments gelatinous, continuous, with very obscure joints, within filled with elliptical *sporangia*.

1. Gl. *fœtidum*, filaments compressed branched flaccid and gelatinous coadunate free at their extremities, branches crowded subdichotomous, dissepiments obsolete, articulations rather long (*Dillw.*) including a solitary elliptical granule. *Dillw. Conf. t.* 104, and *E. B. t.* 2101 (*Conferva fœtida*).

Hab. Rocks on the coast of Morayshire, *Mr. Borrer* and *Hook.*

This is a singular production, and from its smell one would suspect it to be animal matter. I have never been able to distinguish the articulations Mr. Dillwyn mentions, but have found the ovate or elliptical brown bodies in the pellucid membranous filaments to assume a beaded appearance.

8. SCYTONEMA.

Filaments continuous, subcoriaceous (not gelatinous), having internally transverse annuliform parallel sporangia.

1. S. *atro-virens*, tufts brownish black, filaments olivaceous brown rigid branched, branches slender, rings dotted with granules. *Ag. p.* 115. *Conferva atro-virens, Dillw. t.* 25. *Lichen exilis, Lightf. p.* 894. *Collema pannosum, Ach. Syn. Lich. p.* 329.

Hab. Naked rocks in the Highlands, especially such as are moistened by the spray of cataracts, *Lightf.*

Forming dense blackish tufts, with shortish capillary branched filaments. It seems doubtful whether this should be arranged with the *Lichens* or *Confervæ*. External swellings (tubercles or apothecia?) have been observed upon them; but whether actual fructification or not, future observations must determine. Agardh includes in the present genus, besides the plant in question, *Conferva comoides, radicans, Myochrous* and *ocellata* of *Dillw.*, which certainly have a habit in common.

9. OSCILLATORIA.

Filaments continuous, membranaceous, gelatinous, filled internally with transverse parallel annuliform *sporangia*.—The *Oscillatoriæ* are divided into two kinds by Agardh. The *Oscill. veræ* are those which are collected into a gelatinous stratum, shining and blackish green above, after being dried partaking of a beautiful æruginose tint. Their *filaments* have been thought to have a voluntary movement; they elongate and increase rapidly, are always simple, though Agardh has occasionally seen them laterally united. The species of the second division have more the appearance of true *Confervæ*, they are scarcely gelatinous; but they have no true joints, and their internal structure resembles the true *Oscillatoriæ*.

* *Simple decumbent, surrounded by a Mucus* (Oscillatoriæ veræ).

1. O. *nigra*, filaments brownish green rigid straight collected into a gelatinous mass throwing out on all sides of its circumference numerous long rays. *Ag. p.* 103. *Conferva fontinalis, Lightf. p.* 977. *Dillw. t.* 64. *E. B. t.* 2054? *Conferva confragosa, Lightf. p.* 976?

HAB. Under water by the sides of limpid springs or fountains, and on the banks of rivers, *Lightf.* Frequent in wells. *Hopk.*

Vaucher and Agardh describe several species of this family, besides the following, most or all of which will probably prove natives of Scotland.

2. O. *limosa*, filaments blueish green rigid straight collected into a gelatinous mass and throwing out on all sides of its circumference numerous rather short rays. *Conferva limosa, Dillw. t.* 20. *E. B. t.* 2053. *Oscillatoria tenuis, Ag. p.* 105.

HAB. Rivulets and ditches, frequent, *Hopk.*

** *Simple, decumbent, not surrounded by a Mucus* (Confervoideæ).

3. O. *muralis*, filaments green somewhat rigid curved flexuose thickish interwoven into a green stratum, rings lax. *Ag. p.* 108. *Conferva muralis, E. B. t.* 1554. *Dillw. t.* 7.

HAB. On damp walls, stones, and shady gravel walks, very common, *Hopk.* Walls of Branksome castle, *Mr. Turner* and *Hook.*

*** *Erect, simple.*

4. O. *scopulorum*, filaments green curved flexuose erect minute acuminate forming a dense velvet-like substance. *Ag. p.* 111. *Conferva scopulorum, Dillw. Conf. Syn. p.* 39. T. A. *E. B. t.* 2171.

HAB. Rocks by the sea-side at Cawsie, Morayshire, *Mr. Borrer* and *Hook.*

10. ZYGNEMA.

(*Conjugata, Vauch.*)

Filaments, containing *granules* which vary in their arrangement, but take some decided figure, at length, from different filaments, uniting by means of lateral *tubes.*—*Filaments* simple, equal, jointed, green, gelatinous. *Articulations* pellucid. *Granules* disposed either in spiral lines, in stellated figures, or, rarely, scattered. *Joints* as in the true *Confervæ*. The transverse *tubes* are prolonged from the middle of the articulations of two contiguous filaments at the same time, unite into one, are pervious, and transmit the granules from one articulation into that of another filament, where they form an elliptical or sphærical mass.

(Granules disposed in spiral lines.)

1. Z. *nitidum*, articulations about as long as they are broad, spiral lines crossing each other slender crowded, mass of granules at length elliptical. *Ag. p.* 98. *Conferva nitida, E. B. t.* 2337. *Dillw. Conf. t.* 4. *f.* C. *Conjugata princeps, Vauch.*

HAB. In stagnant waters, occasionally, *Hopk.*

Filaments thicker than in the rest of the genus, forming large dark green patches.

2. Z. *quininum*, filaments equal, spiral lines simple rather lax, articulations longer than their diameter, mass of granules at length elliptical. *Ag. p.* 100. *Conferva spiralis, E. B. t.* 1656. *Dillw. Conf. t.* 3.

HAB. A frequent inhabitant of ditches and ponds, *Hopk.* In a burn on the summit of Ben Nevis, *Mr. Turner* and *Hook.*

3. Z. *inflatum*, filaments here and there inflated, spiral lines simple lax, mass of granules at length elliptical. *Ag. p.* 101. *Conferva inflata, E. B. t.* 2376.

HAB. Ditches and bogs, frequent, *Hopk.*

Articulations twice or thrice as long as they are broad.

11. HYDRODICTYON.

Filaments united in a reticulated manner. *Articulations* viviparous. *Frond* utriculate, composed of *filaments* united in such a manner as to form a beautiful net-work. From each *articulation* (forming one side of the, mostly, pentangular areolæ) a new individual is produced, according to Vaucher, entirely resembling the parent plant.

1. H. *utriculatum*. *Ag. p.* 97. *Conferva reticulata, Linn. E. B. t.* 1687. *Dillw. Conf. t.* 97.

HAB. Ditches and pools?

I think, but am not sure, I have heard this has been found in Scotland. It is one of the most singular of all the *Algæ*, and resembles, when floating upon water, a fine and beautiful tubular net.

12. CONFERVA.

Filaments jointed, uniform, bearing excessively minute seeds or sporules internally.—The *filaments* are all uniform, simple or branched, green or coloured, jointed. The *articulations* filled with a mass of sporules, including frequently scattered granules. The *joints* are formed by an annular constriction, where the filaments are easily broken. There is no external *fructification;* but the *granules* frequently vegetate within the filaments, as has been seen to be the case in *Conf. rivularis, fracta,* &c.

* *Coloured, branched, not aquatic.*

1. C. *Orthotrici*, filaments very short olivaceous brown branched

obtuse erect tufted, articulations about as long as they are broad. *Ag. p.* 73. *Dillw. Conf. t.* 89. *C. muscicola, E. B. t.* 1638.

Hab. On *Orthotrichum striatum, Lyellii,* and *pulchellum,* and probably other species of the genus. Very common in Kinross-shire, at Caldron Linn, and Castle Campbell; and in a small wood at the foot of the Pentland hills, *Mr. Arnott.*

2. C. *ebenea,* filaments branched erect tufted rigid subcartilaginous obtuse, articulations as long as they are broad. *Ag. p.* 74. *Dillw. Conf. t.* 100. *Byssus nigra, Lightf. p.* 1003. *E. B. t.* 702.

Hab. Rocks and trees. On the stump of a tree in Macbeth's wood, at Brodie, near Forres, *Hook.*

3. C. *arachnoidea,* filaments decumbent elongate membranaceous equal a little branched loosely entangled and forming a fulvous or brownish mass, the articulations thrice as long as they are broad. *Ag. p.* 74. *Dillw. Conf.* Tab. C.

Hab. On decaying wood, Arlary, by Kinross, *Mr. Greville.*

4. C. *purpurea,* filaments erect subflexuose dichotomously branched forming rather large crimson dense tufts or patches, articulations rather longer than they are broad. *Dillw. t.* 43. *Byssus purpurea, Lightf. p.* 1000. *E. B. t.* 192.

Hab. Upon the Abbot of Mackinnon's tomb, in the ruined Abbey of I-columb-kill, *Lightf.*

** *Coloured, simple.*

5. C. *ericetorum,* filaments simple decumbent intricate forming a purplish stratum, articulations half as long again as they are broad. *Ag. p.* 76. *E. B. t.* 1553.

Hab. On the ground in moist heathy places.

6. C. *Pteridis,* filaments simple creeping brownish orange, articulations longitudinally plicated thrice as long as broad. *Ag. p.* 76.

Hab. About the dead stems of *Pteris aquilina,* not uncommon about Edinb., *Mr. Arnott.*

Growing in small tufts of about an inch or less in diameter. *Filaments* membranaceous, straight, subparallel, fixed by their two extremities, and thus creeping. *Articulations* longitudinally plicated, subcollapsed, somewhat as the medulla in the inside of the quill of a feather. *Ag.*

*** *Greenish, simple.*

7. C. *dissiliens,* filaments simple slender fragile straight, articulations twice as short as they are broad. *Ag. p.* 81. *Dillw. Conf. t.* 63. *E. B. t.* 2464.

Hab. Ditch near Possil bog, *Hopk.*

8. C. *bipunctata,* filaments simple capillary intricate softish, articulations twice as long as they are broad at length with two masses of sporules. *Dillw. t.* 2. *E. B. t.* 1610.

Hab. Stagnant waters, frequent, *Hopk.*

I have seen some states of *C. ericetorum*, which I have hardly known from this. This is more or less green.

9. C. *capillaris*, filaments very long simple flexuose loosely entangled, articulations nearly twice as long as they are broad, when dry alternately contracted. *Ag. p.* 81. *E. B. t.* 2364 (*excluding the branching plant*).

Hab. Marshy ditches and stagnant waters near the sea-side, *Lightf.*

Rather stout, rigid.

10. C. *vesicata*, "variegated with brown and green, filaments unbranched slender, articulations half as long again as broad, alternately pellucid and opaque here and there swelling." *Sm. Ag. p.* 82. *Conf. alternata, E. B. t.* 2301. *Dillw. Conf. Syn. t.* B.

Hab. Ditches and stagnant waters, frequent. Pond at Dalbeth, abundant, *Hopk.*

11. C. *tumidula*, "green, filaments unbranched, articulations thrice as long as broad, when fertile swelling and elliptical." *Sm. E. B. t.* 1670 (*excluding the synonym of Vauch.*).

Hab. Ditches and bogs with *Zygnema inflata*, but not common, *Hopk.*

12. C. *rivularis*, filaments simple capillary very long equal, joints pellucid, articulations granuliferous about twice as long as they are broad. *Dillw. Conf. t.* 39. *E. B. t.* 1654. *Lightf. p.* 975. *C. rivularis*, γ. *Ag. p.* 87.

Hab. Brooks and rivers, frequent, *Lightf., Hopk.*

Agardh considers the *C. crispata, Dillw. t.* 93, a var. of this.

**** *Branched, green, aquatic.*

13. C. *fracta*, filaments rigid very much branched capillary, branches divaricated alternate, articulations 4—5 times as long as they are broad. *Ag. p.* 88. *Dillw. Conf. t.* 14. *E. B. t.* 2338. *C. bullosa, Lightf. p.* 977.

Hab. Stagnant waters, common, *Lightf., Hopk.*

Conf. flexuosa of *Dillw.* and *E. B.* is made the var. β. *prolifera* of Agardh.

14. C. *glomerata*, filaments very much branched capillary, branches alternate, the ultimate ones fastigiate subsecund, articulations cylindrical about four times as long as broad. *Ag. p.* 89. *Lightf. p.* 993. *Dillw. Conf. t.* 13. *E. B. t.* 2192. *C. læte-virens, Dillw. Conf. t.* 48. *E. B. t.* 1854. *Conf. albida, E. B. t.* 2327 ?

Hab. In pools and ditches, and in the sea, most abundant.

15. C. *lanosa*, yellowish green, filaments slender very much branched rather short, branches remote alternate, articulations below about twice, the ultimate ones thrice, as long as they are broad. *Dillw. Suppl. t.* E. *E. B. t.* 2099. *C. æruginosa? Lightf. p.* 980.

Hab. On *Fuci* and *Corallines* at Forres, Morayshire, *James Brodie, of Brodie, Esq.*

About 1 inch long, growing in rather dense, fasciculated tufts.

16. C. *rupestris*, filaments fasciculated very much branched straight twiggy obtuse, branches erect, joints pellucid, articulations cylindrical thrice as long as broad. *Ag. p.* 91. *Dillw. t.* 948. *E. B. t.* 1699.

Hab. Rocks on the sea-shore, common.

Three to five inches long, blackish green, rigid; when dry not adhering to paper.

17. C. *ægagropila*, filaments divaricating from a centre very much branched rigid obtuse forming a compact globe, articulations 4—5 times longer than broad. *Ag. p.* 92. *E. B. t.* 1377. *Dillw. Conf. t.* 87.

Hab. Lakes and ditches, north of Scotland, *James Brodie, of Brodie, Esq.* In ditches, bogs, and stagnant waters, occasionally. In a ditch leading into Mugdoch-lake, plentifully, and in the Loch, *Hopk.*

This extraordinary production varies in diameter from half an inch to 2—3 inches, forming a compact green ball, which is said in *E. Bot.* to be useful for wiping pens upon. The name is derived from its resemblance to the balls that are found in the stomachs of goats. In drying, the filaments become contracted at the joints.

18. C. *lubrica*, filaments very much branched slender gelatinous, branches and branchlets approximate subulate pellucid at the extremities, articulations thrice as long as they are broad marked with a dark green zone in the middle. *Ag. p.* 92. *Dillw. Conf. t.* 57.

Hab. In a rivulet running into the water of Leith, in the middle of the Glasgow road from Edinb., *Mr. Greville.*

19. C. *olivacea*, filaments branched erect tufted intricate abbreviated rather rigid olive green, branches subsimple alternate obtuse, articulations about as long as broad. *Dillw. Conf. Syn. p.* 57. *t.* C.

Hab. Marine rocks in Papa Westra, Orkney, *Mr. Borrer* and *Hook.*

About half an inch long, much entangled, flexuose.

***** *Green, branched, not aquatic.*

20. C. *velutina*, filaments creeping and rooting branched, branches flexuose subpellucid erect obtuse collected into a beautiful green velvet-like stratum, superior articulations twice as long as they are broad. *Ag. p.* 94. *Dillw. Conf. t.* 77. *E. B. t.* 1556. *Byssus velutina, Lightf. p.* 1001.

Hab. Damp, clayey banks, sides of ponds, rivers, &c., *Lightf., Hopk.*

13. LEMANIA.

Filaments torulose, bearing their fructification internally. *Sporules* beaded, collected into pencil-shaped tufts, and fixed to the inner surface of the hollowed parts of the frond.—*Filaments* rigid, generally olivaceous, scarcely jointed, truly torulose or inflated at intervals, formed of a thickish membrane, whose texture is evidently cellular.

1. L. *fluviatilis*, filaments subsimple olive-green torulose attenuated, intervals between the swellings cylindrical much longer than they are broad. *Ag. p.* 70. *Conferva fluviatilis, Dillw. Conf. t.* 29. *E. B. t.* 1763. *Lightf. p.* 985.

Hab. In the beds of alpine torrents, upon the rocks near Comrie, 4 m. west of Crieff, *Dr. Stuart.* Craig-hall, near Edinb., *Mr. Yalden.* Rare about Glasg.; in a rivulet on the hill to the north of Milngavie, *Hopk.* In the bed of the Clyde near the falls, *Mr. Turner* and *Hook.* Not uncommon about Edinb., *Mr. Greville.*

Filaments thick, tufted, elongated, from 2 to 5 inches in length, attenuated at the base and at the extremity.

14. GRIFFITHSIA[a].

Seeds immersed in a gelatine, and surrounded by an involucrum.

1. Gr. *corallina*, crimson much branched, articulations swelling upwards thrice as long as broad, the fertile ones fringed at the summit with short incurved simple filaments (involucre) enfolding numerous clustered seeds imbedded in a mucus. *Conferva corallina*, *E. B. t.* 1815. *Lightf. p.* 988.

Hab. On the western coast in deep waters, sometimes dragged up in fishing-nets, or cast upon the shore in storms, *Lightf.*

Turns whitish or greenish brown in drying.

2. Gr. *equisetifolia*, red branched cylindrical, branches clothed with short whorled imbricated forked jointed filaments whose articulations are four times as long as they are broad and a little thickened upwards. *Conferva equisetifolia, Lightf. p.* 984. *E. B. t.* 1479.

Hab. Firth of Forth, but rare, *Mr. Yalden.*

In the crowded and whorled disposition of the branches it would appear, at first sight, to have considerable affinity with *Cladostephus spongiosus* and *verticillatus*; but the structure of the articulations is very different.

15. CERAMIUM.

Fructification: Capsules. Filaments composed of simple tubes.

* *Reddish. Capsules subinvolucrate.*

1. C. *rubrum*, filaments dichotomous very much branched subcartilaginous, branchlets forked, articulations opaque towards the joints which are contracted, capsules globose lateral invo-

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[a] This truly beautiful genus is named by Agardh in honour of Mrs. Griffiths of Torquay, Devonshire, to whom the marine botany of this country is under the greatest obligations, and who has contributed so largely to the *Historia Fucorum* of Mr. Turner. This lady is paying particular attention to the fructification of the *Algæ*; and her discoveries will, I am confident, throw new light upon this tribe of plants.

lucrated. *Ag. p.* 60. *Conferva rubra, E. B. t.* 1166. *Conf. nodulosa, Lightf. p.* 994.

HAB. Common on rocks, stones, and sea-weeds, on the shores.

From 4—8 inches long. *Involucres* of from 2—4 setaceous, incurved, simple branchlets. A var. of this, as it is considered by Mr. Dillwyn, is published by that gentleman, having *seeds* scattered in the ultimate *ramuli,* and the *articulations* with a dark spot in the centre, pellucid near the joints.

2. C. *diaphanum,* filaments dichotomous very much branched submembranaceous alternately marked with reddish purple and white pellucid rings, branchlets forcipate the joints swollen, capsules globose lateral involucrated. *Ag. p.* 61. *Conferva diaphana, E. B. t.* 1742.

HAB. Rocky shores, frequent, *Lightf., Mr. Greville.*

Much smaller than the last, and vastly more delicate.

3. C. *ciliatum,* filaments dichotomous much branched membranaceous, articulations opaque at the joints which are beset with whorled bristles, branchlets remarkably forcipate, capsules globose lateral involucrated. *Conferva ciliata, Lightf. p.* 998. *E. B. t.* 2428.

HAB. Upon the western coast, entangled among the branches of *Fucus plicatus, Lightf.*

Still smaller and more delicate than the last. May not this be the younger and *C. diaphanum* the intermediate state of *C. rubrum?*

** *Reddish. Capsules naked, subsessile, inserted upon the extremity of the articulations.*

4. C. *roseum,* filaments extremely slender repeatedly branched membranaceous, branches and branchlets alternate very much crowded, joints somewhat contracted, articulations about thrice as long as broad, capsules secund. *Ag. p.* 62. *Conferva rosea, E. B. t.* 966.

HAB. In the Firth of Forth, near Kirkcaldy, *Mr. Greville.*

A very elegant species, of a purplish rose-colour. *Capsules* upon the ultimate branches.

5. C. *Hookeri,* filaments very much branched, the primary ones without joints, branchlets pinnate slender flexuose scattered pale reddish brown, pinnules alternate jointed, articulations half as long again as broad. *Dillw. t.* 106 (*Conferva Hookeri*).

HAB. Rocks in the sea at Cawsie, Morayshire, *Mr. Borrer* and *Hook.*

Two to four inches long, very gelatinous when fresh, and adhering firmly to paper in drying.

6. C. *Rothii,* filaments erect dichotomous short very densely cæspitose crimson, branches alternate, articulations thrice as long as broad. *Conferva Rothii, Dillw. Conf. t.* 73.

HAB. Rocks upon the coast of Durness, Sutherland; and in the island of Papa Westra, Orkney, *Mr. Borrer* and *Hook.* Rocks by the seashore at the mouth of the Firth of Forth, *Mr. Greville.*

Scarcely a quarter of an inch in height, spreading in rather large patches like crimson velvet. The *fructification* is unknown, but the habit and place of growth bespeak it a *Ceramium.*

*** *Brownish or orange-coloured.*

7. C. ***tomentosum,*** filaments very much branched extremely slender intricate collected into long almost spongy fascicles, branches divaricating, articulations about 4 times as long as they are broad. *Ag. p.* 64. *Conferva tomentosa, Lightf. p.* 982. *Dillw. Conf. t.* 56.

Hab. Marine rocks on the western coast, frequent, generally adhering to the larger *Fuci, Lightf.*

Two to four inches long, brown. Agardh has observed long pods with seeds like those of *C. siliculosum.*

8. C. *littorale,* filaments very slender very much branched collected into numerous long fascicles, branches erect acuminate, articulations as long as they are broad. *Ag. p.* 65. *Conferva littoralis, E. B. t.* 2290. *Dillw. Conf. t.* 31.

Hab. Rocks and *Fuci,* abundant.

Four to six inches long, soft. Mr. Dillwyn has observed sphærical sessile *capsules* and swelling *articulations* apparently filled with *granules* at the extremities of some of the *branches.*

9. C. *siliculosum,* filaments very slender free, branches alternate subulate erect, articulations as broad as they are long, capsules pod-shaped with scattered seeds. *Ag. p.* 65. *Conferva siliculosa, Dillw. t.* E. *E. B. t.* 2319.

Hab. Upon *Fuci* on the Moray coast, *Mr. Borrer* and *Hook.*

Much smaller, slenderer, and paler than the last; and never collected into fasciculated, dense *branches,* as is the case in the two last.

10. C. *cirrosum,* branches pinnate, pinnules distichous nearly opposite subhorizontal approximate straight almost pectinate, articulations as long as they are broad. *Ag. p.* 67. *Conferva pennata, Dillw. Conf. t.* 86. *E. B. t.* 2330.

Hab. Rocks and on *Fuci,* coast of Moray, *James Brodie, of Brodie, Esq.* South Queen'sferry and Dunbar, *Mr. Borrer* and *Hook.* Firth of Forth, near Kirkcaldy, *Mr. Greville.*

One to two inches long, rigid, olive brown, fasciculate, dense. *Capsules* ovate, sessile or pedunculate.

11. C. *scoparium,* filaments very much branched rigid, branches fasciculate erecto-patent ultimate ones subulate alternate distichous, articulations about as long as they are broad. *Conferva scoparia, E. B. t.* 1552. *Dillw. Conf. t.* 52. *Lightf. p.* 981.

Hab. Rocks and *Fuci,* plentiful.

Two to four inches long, densely fascicled, darkish brown, rigid. *Capsules* at the extremities of the branches, according to Smith.

12. C. *aureum,* filaments flexuose collected into a dense soft pulvinate fine orange-coloured tuft, branches elongate patent

rather rigid, articulations twice as long as they are broad. *Ag. p.* 68. *Conferva aurea, Dillw. t.* 35. *Byssus aurea, Lightf. p.* 1002. *E. B. t.* 212.

Hab. Rocks in the Highland mountains, frequent, *Lightf.* Rare about Glasg.; below a rock at Mugdoch castle, *Hopk.* Upon the bark of trees, about Edinb., where it grows much smaller, yet bearing capsules, *Mr. Arnott.*

In the Herbarium, the colour changes to dull brownish yellow. The *capsules* are figured by Dillwyn, both lateral and terminal, oval.

16. HUTCHINSIA.

Fruit of two kinds: ovate reticulated capsules, and swollen branchlets containing globular seeds. *Filaments* formed of a number of parallel *tubes.*—*Filaments* more or less tufted, purplish, gradually attenuated, very much branched in a subfasciculated manner and jointed, frequently swelling at the joints; *articulations* composed of a number of parallel *tubes,* which give them a striated, rarely a reticulated, appearance; at the extremity of the branches, particularly when young, often having a small, pellucid tuft of hairs. *Fruit* of two kinds: ovate *capsules,* broader at the base, acuminated at the point, sometimes truncated, sessile with a few pyriform *seeds*; and *seeds* or globular granules, longitudinally arranged and imbedded in pod-shaped branchlets.

1. H. *fastigiata,* filaments dichotomous nearly equal fastigiate, articulations shorter than broad with a dark spot in their centre. *Ag. p.* 53. *Conferva polymorpha, E. B. t.* 1764. *Dillw. Conf. t.* 44. *Lightf. p.* 989.

Hab. Upon the rocky shores and on the larger *Fuci,* abundant.

A rigid, stout plant, of a very dark brown colour, black in drying, the branches forming a nearly level top, and the articulations with a central spot.

2. H. *elongata,* filaments dichotomous very much branched, branches elongated the ultimate ones very slender, articulations rather shorter than they are broad reticulated with veins, the lower joints obsolete. *Ag. p.* 54. *Conferva elongata, E. B. t.* 2429. *Dillw. Conf. t.* 33.

Hab. Adhering to rocks, shells, and the larger *Fuci.* Firth of Forth, near Kirkcaldy, *Mr. Greville.*

The largest of our *Confervæ,* though not the longest, and aptly named in some places *Lobster-horn Conferva.* It is in length from 4 to 8 or 9 inches, and of a dark purplish red colour. *Capsules* ovate, sessile, by no means common; still rarer are the minute fasciculated *pods,* figured by Dillwyn in his supplementary plate, Tab. C.

3. H. *fucoides,* filaments very much branched diffuse, branchlets subulate alternate, articulations below shorter than broad, above about half as long again as broad, capsules ovate late-

ral or terminal. *Hutchinsia violacea, Ag. p.* 54. *Conferva fucoides, E. B. t.* 1743, and *t.* 1717 (*C. nigrescens*). *Dillw. Conf. t.* 75, and *p.* 81 (*C. nigrescens*).

β. paler, small, terminated by small pencils of pellucid branchlets. *C. fibrata, Dillw. Conf. Syn. p.* 84. *t.* G. *E. B. t.* 2139.

Hab. Common on rocks, stones, &c., in the sea. β. Coast of Moray, *Mr. Brodie, Mr. Borrer* and *Hook.*

From 4—6 inches long, of a blackish brown colour, bushy. In *C. nigrescens,* the branches are fewer and straighter; I suspect, the effect of injury. β. is small, reddish and fibrillose at the extremity, —probably only the young state of the plant.

4. H. *urceolata,* filaments very much branched bushy, branchlets short and spreading, lower articulations much longer, upper shorter than broad, capsules urceolate. *Conferva urceolata, Lightf. Mss.* (*according to Mr. Turner*). *Dillw. Syn. p.* 82. *t.* G. *E. B. t.* 2365. *Conf. nigrescens? Huds. Angl.*

Hab. Rocks and *Fuci,* at Forres, *James Brodie, of Brodie, Esq.* Firth of Forth, near Kirkcaldy, *Mr. Greville.*

From 4 to 6—8 inches long, very bushy, of a fine deep pellucid red when fresh, blackish brown when dry.

5. H. *badia,* "filaments branched straight reddish black, branches elongated, branchlets abbreviated remote subsimple, articulations half as long again as their diameter." *Dillw. Ag. p.* 56? *Conferva badia, Dillw. Conf. Syn. p.* 85. *t.* G.

Hab. Shores of the Firth of Forth, near Kirkcaldy, *Mr. Greville.*

Mr. Dillwyn says "this is intermediate between the *fucoides* and *urceolata,* from both of which it may be distinguished by its articulations, which are nearly of the same length throughout." If that be the case, it cannot be the *H. badia* of Agardh (who indeed quotes Dillwyn, the original authority for the name, doubtfully); for he expressly says, that the lower articulations are twice as short as they are broad, and that the upper ones are thrice as long; and he compares his plant with *H. stricta,* from which he tells us it differs in colour.

6. H. *stricta,* filaments branched nearly equal slender fastigiate purplish red, branches dichotomous nearly erect, articulations about thrice as long as they are broad. *Ag. p.* 56. *Conferva stricta, Dillw. Conf Syn. p.* 83.

Hab. Rocks, &c., in the Firth of Forth, near Kirkcaldy, *Mr. Greville.*

About 4—5 inches long, remarkable for its slender straight twiggy branches, long joints, and fine colour.

7. H. *Brodiæi,* filaments very much branched purplish black, branches elongate, branchlets scattered patent fasciculated multifid, articulations of the main branches obsolete, those of the branchlets about half as long again as broad. *Conferva Brodiæi, Dillw. Conf. t.* 107. *E. B. t.* 2589.

Hab. Rocks in the sea near Forres, first discovered in Britain by *James Brodie, of Brodie, Esq.*

This is said to reach to the length of a foot or a foot and a half. The branches are however very slender, and the ultimate ones collected into numerous broad fascicles, which give the whole plant a singular appearance. *Fruit* either *capsular*, or *seeds* longitudinally arranged in the ultimate branchlets.

8. H. *arbuscula*, primary filaments incrassated with the joints obsolete, above very much branched reddish purple, branchlets crowded subverticillate abbreviated multifid patent, with the articulations about as long as they are broad. *Dillw, Conf. t.* 85, and *t.* G. *E. B. t.* 1916.

HAB. Shores of Orkney and Caithness, *Mr. Borrer* and *Hook.* Firth of Forth, *Mr. Arnott* and *Mr. Greville.*

This beautiful species is about 2 or 4 inches long, very delicate, deepish rose-colour. Two kinds of *fruit* have been found upon it, sessile *capsules* and swollen extremities of the branches with a double row of *seeds.*

9. H. *coccinea*, scarlet, filaments subcartilaginous very much branched hairy below, branches alternately doubly pinnate, the ultimate ones tufted, joints rather obscure about as long as they are broad. *Conferva coccinea*, *E. B. t.* 1055. *Dillw. Conf. t.* 36. *Conf. plumosa*, *Lightf. p.* 996.

HAB. It appears to be rare in Scotland. *Lightfoot* says that fragments of it were found on the western coast. *Mr. Greville* has gathered it in the Firth of Forth, near Kirkcaldy. Most allied to the last species.

17. CLADOSTEPHUS.

Filaments jointed, the primary ones solid. *Branches* of a different structure from the main stem, mostly whorled at the joints. *Fruit* capsular.

1. C. *verticillatus*, filaments dichotomous branched cartilaginous thick olive brown, branchlets verticillate incurved very short generally forked, articulations shorter than broad. *Conferva verticillata*, *Lightf. p.* 984. *Dillw. Conf. t.* 55. *E. B. t.* 1718.

HAB. Among the sea rocks in basins of water left by the tides, in the Firth of Forth, and many other places, not unfrequent, *Lightf.*

Four or six inches long. *Fruit*, according to Smith, oblong pedunculated *capsules* proceeding from the *ramuli.*

2. C. *spongiosus*, " filaments branched cartilaginous thick olivaceous, branchlets simple very short scattered and imbricated on all sides, articulations about half as long again as broad." *Dillw. Conferva spongiosa*, *Dillw. Conf. t.* 42. *E. B. t.* 2427. *Lightf. p.* 983.

HAB. Among the sea rocks in the Firth of Forth, and many other places, *Lightf.*

About 3 inches long, irregularly branched. *Capsules* like those of *C. verticillatus.*

DIV. III. ULVOIDEÆ. *Fruit: either naked seeds immersed in the frond or capsules. Frond continuous; its structure cellular subregular. Substance submembranaceous, thin. Colour frequently greenish. Frond plane or tubular, containing immersed seeds, or capsules of the same substance and colour as the frond, or minute blackish tubercles scattered upon the frond.*

18. ZONARIA.

Capsules approximated and arranged in linear parallel lines.—*Root* and *stipes* downy. *Frond* membranaceous or subcoriaceous, flabelliform or dichotomous, composed of straight parallel fibres from the base to the summit, often interrupted by darkish transverse lines.

* *Lines of fructification concentrical* (Frond flabelliform).

1. *Z. pavonia,* frond subcoriaceous flabelliform subdichotomous greenish brown above with numerous concentric lines of fructification, white and somewhat powdery beneath. *Ulva pavonia, Lightf. p.* 966. *E. B. t.* 1276.

HAB. Sea-rocks near Aberdeen, discovered by *D. Cargill,* above 140 years ago, according to *Lightf.*

** *Lines of fructification interrupted* (Frond generally narrow and dichotomous).

2. *Z. dichotoma,* frond membranaceous olive-green dichotomously divided linear obtuse, fructification in longitudinal interrupted dots. *Ulva dichotoma, Lightf. p.* 975. *t.* 34. *E. B. t.* 774. *Hook. in Fl. Lond. with a figure.*

HAB. In basins of water among the rocks, about Leith, New-Haven, &c., *Lightf.*

Frond 3—6 inches long, thin and membranous.

19. ULVA.

Seeds placed in clusters frequently of four, and scattered throughout every part of the *frond.*—*Frond* membranous or gelatinous, plane, plicated, or tubular. Mostly marine; some few are inhabitants of fresh water, rarely growing out of water.

* *Fronds plane.*

1. U. *Lactuca,* fronds aggregate oblong plane waved green attenuated below spreading upwards and cut and crisped at the margin. *Ag. p.* 40. *Lightf. p.* 970. *E. B. t.* 1551.

HAB. In the sea, frequent, growing upon stones, shells, &c., *Lightf.*

Substance very thin, semipellucid, varying much in size, and I suspect the *Ulva latissima* of Agardh to be only a var. *Fronds* clustered. Agardh says they are at first saccate, but soon open at the base, and spread out. This is the "green *Laver,*" or "oyster-green," known at table, where it is served occasionally stewed with lemon-juice, in the same way as *U. umbilicalis.* It is esteemed good, as indeed almost all esculent vegetables are, for scrophulous habits. Lightfoot says that the islanders ascribe to it an anodyne virtue, and bind it about the front and temples to assuage head-ache in fevers and to procure sleep.

2. U. *bullosa*, frond dilated tubular then spreading plane green variously sinuated and folded subgelatinous lubricous. *Ag. p.* 41, *E. B. t.* 2320. *Ulva Lactuca* β., *Lightf. p.* 971.

Hab. Fresh water ditches and pools, *Lightf.*

Smaller, subgelatinous, lubricous, firmly adhering to paper, and excessively tender, otherwise much resembling *U. Lactuca.* May not the differences arise from the different places of growth?

3. U. *umbilicalis*, fronds broadly oblong membranaceous purplish spreading nearly plane waved and crisped. *Lightf. p.* 967. *E. B. t.* 2286. *Ulva laciniata? Lightf. p.* 974. *Ulva purpurea*, *Ag. p.* 42.

Hab. Rocks on the shore, frequent, *Lightf.* Mouth of the Clyde, not common, *Hopk.*

This, under the name of *Laver*, is much eaten in many parts of England, pickled with salt and preserved in jars, and when brought to table served up with lemon juice. According to Lightfoot, the inhabitants of the western isles gather it in the month of March, and, after pounding and stewing it with a little water, eat it with pepper, vinegar, and butter. Others stew it with leeks and onions.

4. U. *Linza*, frond linear-lanceolate green with the margin waved and crisped. *Ag. p.* 44. *Lightf. p.* 968. *Dill. Musc. t.* 9. *f.* 6.

Hab. Ditches, especially of salt and brackish water.

Six inches to a foot long.

5. U. *crispa*, fronds bullate plicate and crisped wrinkled green collected into a broad mass or stratum. *Lightf. p.* 972. *Ag. p.* 43. *Dill. Musc. t.* 10. *f.* 12.

Hab. Upon the ground in shady places, below walls and houses and upon thatched roofs, not uncommon.

6. U. *montana*, " frond coriaceous dark red of numerous ascending rounded flattish finely granulated lobes." *Sm. Lightf. p.* 973. *E. B. t.* 2193.

Hab. Among grass and moss upon the mountains, in the Isle of Skye and on the western coast, *Lightf.*

This is called *mountain dulse* by the Scotch; and the Highlanders, according to Lightfoot, wash it, and rub it between their hands in water, so as to make a paste, with which they purge their calves.

** *Fronds tubular.*

7. U. *intestinalis*, frond linear-oblong very much sinuated and wrinkled tubular green simple. *Lightf. p.* 968. *Ag. p.* 45. *Dill. Musc. t.* 9. *f.* 7.

Hab. Ditches, especially of salt or brackish water.

8. U. *compressa*, frond tubular linear or filiform simple or

branched subcompressed. *Lightf. p.* 969. *E. B. t.* 1739. *Dill. Musc. t.* 9. *f.* 8. A—G.

Hab. In the sea and in marine ditches; sometimes in fresh-water.

Extremely variable in its length and breadth; occasionally so narrow as to resemble a very long *Conferva.* May not this and the last species be mere vars. of each other?

9. U. *fistulosa*, frond tubular filiform tapering at the base and summit simple brown subgelatinous and here and there contracted. *E. B. t.* 642. *Conferva Fistula, Roth. Cat. Bot. v.*3. *p.* 169. *U. incrassata, Fl. Dan. Fucus Filum*, β. *Ag. p.* 14.

Hab. Firth of Forth, near Dysart, attached to rocks and shells, *Mr. Greville.*

Four to 6 or 8 inches high, sometimes divided at the very base.

10. U.? *defracta*, frond filiform tortuose gelatinous white pellucid with numerous red dots. *E. B. t.* 1626.

Hab. Attached to *Fuci*, &c., on the shores of the Orkney islands, *Mr. Borrer* and *Hook.*

This has rather the appearance of animal matter, and is very unlike any other *Ulva.* It is from 1—2 inches long, and about 1 or 1½ line in diameter, adhering by its viscid quality to marine bodies.

11. U.? *purpurascens*, subgelatinous purplish filiform attenuated branched, branches scattered long simple distant. *E. B. t.* 641. *Ulva filiformis, Wahl. Lapp. p.* 508.

Hab. In the sea near Granton, *Maugh.*

Internally gelatinous, and scarcely of this genus.

20. VAUCHERIA. *Decand.* (*Ectosperma* Vauch.)

Fruit: vesicles of the same texture and substance as the *filaments*, which have within a scattered granulated mass.—*Fronds* filiform, tubular, branched, continuous, rather rigid, intricate, so as to be with difficulty unravelled, composed of a subdiaphanous membrane or coat. *Vesicles* generally lateral, sometimes terminal, often pedunculated, about twice as broad as the *filament*, solitary or clustered: these fall off, and, according to Vaucher, vegetate. Between these *vesicles* are, not unfrequent, in some species, sterile, hooked *peduncles*, which some have called *anthers.*—The species live in fresh water or upon moist earth.

* *Growing in water.*

1. V. *cæspitosa*, filaments dichotomous cæspitose, vesicles two terminal with an intermediate horn-like process. *Ag. p.* 48. *Conferva canalicularis, Lightf. p.* 978.

Hab. Found frequently upon the planks in mill-dams, and in the cavities of water-pipes, *Lightf.*

Forming a densely interwoven tuft or mass, deep green, from 1—2 inches high.

2. V. *ornithocephala*, filaments loosely branched, vesicles gene-

rally in pairs ovate obliquely but shortly beaked upon a short straight peduncle. *Ag. p.* 49. *Conferva vesicata, Dillw. Conf. t.* 49. *Conf. amphibia, Lightf. p.* 979. *Dillw. t.* 41.

HAB. Ditches, *Lightf.*

Several aquatic species of this genus were included, by Linnæus and the older botanists, under the name of *C. amphibia.*

** *Growing on the earth.*

3. V. *Dillwynii,* filaments flexuose, vesicles sessile lateral globose. *Ag. p.* 50. *Conferva frigida, Dillw. t.* 16.

HAB. Upon the ground in damp situations.

It seems very doubtful if the number and form even of the *vesicles* is to be depended upon as constituting specific distinctions. This is probably but a var. growing upon land of *V. cæspitosa. Filaments* 1 or 2 inches long, branched, intricate, forming a green *stratum* on the earth.

4. V.? *radicata,* " filaments rooting, vesicles solitary terminal globose." *Ag. p.* 52. *Ulva granulata, Lightf. p.* 976. *Tremella granulata, E. B. t.* 324.

HAB. On the perpendicular banks of rivers and lochs, in shady places, not unfrequent, *Lightf.*

This seems of doubtful genus, and I confess myself never to have seen the *filaments,* described by Agardh, the existence of which has induced that author to place the plant among the *Vaucheriæ.* Agardh says the *filaments* are clustered, very short, rooting below the soil, and branched, green above, colourless at the base. The *vesicles* are green, nearly as large as hemp-seed, and not elevated at all above the soil, full of a watery fluid within. The membranous *coat* has internally a number of small *granules* imbedded in it, which Agardh does not appear to have seen. In dry weather the upper part of the *vesicles* collapses, sinks in, and the *vesicle* becomes cup-shaped.

DIV. IV. FUCOIDEÆ. *Fruit: either naked seeds immersed in the frond, or capsules included in proper receptacles. Frond continuous. Texture fibrous, fibres longitudinal, intricate. Substance coriaceous or cartilaginous. Colour olive-brown, becoming black by exposure to the air.*

21. FUCUS.

Receptacles tuberculated, tubercles perforated, containing within clustered *capsules,* mixed with jointed *fibres.*

1. F. *natans,* stem compressed filiform pinnated, branches alternate simple, leaves linear-lanceolate serrated, vesicles sphærical on flat petioli, receptacles cylindrical racemose. *Turn. Hist. Fuc. t.* 46. *E. B. t.* 2114.

HAB. Cast on shore occasionally among the Orkney islands, but wafted probably from the W. Indies, *Mr. P. Neill.*

In some more southern seas this species floats in such immense quantities as to impede the progress of ships.

2. F. *bacciferus*, stem cylindrical filiform bipinnate, branches alternate mostly simple, leaves linear serrated, vesicles sphærical on cylindrical petioli. *Turn. Hist. Fuc. t.* 47. *E. B. t.* 1967.

HAB. Occasionally wafted to the Scottish shores, probably from the American seas. *Mr. P. Neill* has seen a specimen from Orkney.

3. F. *granulatus*, stem covered with elliptical knobs, branches filiform repeatedly pinnated, spines numerous scattered, vesicles elliptical innate moniliform, tubercles either scattered over the branches or collected into a lineari-subulate terminal receptacle. *Turn. Hist. Fuc. t.* 251.

β. concatenatus, vesicles elliptical distinct all arranged in a moniliform manner, tubercles collected into linear-acuminated receptacles. *Turn. F. concatenatus, Lightf. p.* 923.

HAB. *β.* Coast about Leith and Newhaven: a fragment was communicated to Mr. Lightfoot by *Mr. Yalden.*

Colour olive brown; 6 inches to 1 foot or more long.

4. *F. Mackaii*, frond coriaceous filiform, rounded dichotomous the extremities obtuse, vesicles scattered innate with the frond elliptical solitary broader than the frond. *Turn. Hist. Fuc. t.*52. *E. B. t.* 1927.

HAB. Gathered many years ago in Loch Seaforth by the late *Lord Seaforth*, in whose collection at Brahan-castle I saw it in 1808. Loch Coul and Kyle Scough, Sutherland, abundant, *Mr. Borrer* and *Hook.* Shores of Arasaig, *Mr. Borrer.*

Five to 9 or 10 inches high. *Fructification* unknown.

5. F. *siliquosus*, stem coriaceous compressed linear branched pinnated like the branches with distichous alternate compressed petiolated jointed linear-lanceolate vesicles, leaves placed near the base distichous alternate flat linear entire, receptacles placed near the apices distichous alternate compressed linear-lanceolate pedunculated. *Turn. Hist. Fuc. t.* 159. *Lightf. p.* 922.

β. smaller.

HAB. Rocky shores, but not very frequent, *Lightf.* Rare about the Firth of Forth. *β.* Sea-shore at Caroline Park, *Maugh.*

One to one foot and a half long; about 6 inches in *β.*, which has more abundant *receptacles* and fewer *vesicles.*

6. F. *nodosus*, frond coriaceous compressed veinless subdichotomous branched in a pinnated manner, vesicles innate inflated, receptacles distichous large pedunculated roundish pyriform mostly solitary. *Turn. Hist. Fuc. t.* 91. *E. B. t.*570. *Lightf. p.*918.

HAB. On rocky shores, common.

From 2 to 4 or 6 feet long. This is said by *Mr. Turner* to be preferred in the Hebrides to all other *Fuci* in the manufacturing of kelp, and passes there under the name of *Kelp-wrack.*

7. F. *vesiculosus*, frond coriaceous flat with a central rib linear-dichotomous quite entire, vesicles sphærical innate in the mem-

brane of the frond, receptacles solitary terminal compressed turgid mostly elliptical. *Turn. Hist. Fuc. t.* 88. *E. B. t.* 1066. *Lightf. p.* 904, and *p.* 910 (*F. inflatus*), and *p.* 909 (*F. divaricatus*).

β. *spiralis*, frond twisted in a spiral manner, vesicles none, receptacles roundish. *Turn. F. spiralis, Lightf. p.* 911. *E. B. t.* 1685.

η. *linearis*, frond narrow dwarfish, vesicles none, receptacles long between linear and lanceolate. *Turn. F. distichus, Lightf. p.* 912.

Hab. Rocky shores, abundant. β. Shore near Leith and Newhaven, *Mr. Yalden.* η. Loch Stennis, in Orkney, *Dr. Hope.*

This species is by far the most abundantly employed in the manufacturing of kelp, if it be not the best. But this, important as it is in a commercial point of view, is not the only end it serves. In the isles of Jura and Skye it is frequently a winter food for cattle, which regularly come down to the shores at the recess of the tide to seek for it; and sometimes even the deer have been known to descend from the mountains to the sea-side to feed upon this plant. Linnæus informs us that the inhabitants of Gothland, in Sweden, boil this *Fucus* with water, and, mixing with it a little coarse meal or flour, feed their hogs with it; for which reason they call the plant *Swintang:* and in Scania, he says, the poor people cover their cottages with it, and use it for fuel.—In Jura and some other Hebrides, the inhabitants dry their cheeses without salt, by covering them with the ashes of this plant; which abounds so much in salt, that from five ounces of the ashes may be procured two ounces and a half of fixed alkaline salts, or half their weight. The medicinal virtues of this *Fucus* have been much celebrated by *Dr. Russel,* in his *Dissertation concerning the Uses of Sea-water in Diseases of the Glands.* He found the saponaceous mucus or liquor in the *vesicles* of this plant to be an excellent resolvent, extremely serviceable in dispersing all scorbutic or scrophulous swellings of the glands; and by calcining the plant in the open air, he made a very black salt powder, which he called *vegetable Æthiops,* a medicine that has been much in use as a resolvent and deobstruent, and recommended also as an excellent dentifrice, to correct the scorbutic laxity of the gums, and take off the foulness of the mouth, *Lightf.*

8. F. **serratus**, frond coriaceous flat with a central rib linear dichotomous serrated at the margins, receptacles solitary terminal flat linear serrated sharpish. *Turn. Hist. Fuc. t.* 90. *Lightf. p.* 902. *E. B. t.* 1221.

Hab. Rocks on the shores, most abundant.

The serrated *fronds* and absence of *vesicles* will always distinguish this species. It contains far less salt than the last species, and is consequently much less esteemed for kelp. In Norway it is the food of cattle, sprinkled with a little meal, according to Gunner. The Dutch cover their crabs and lobsters with it, and say that it is preferable to *F. vesiculosus,* because the mucus from the *vesicles* of the latter ferments and soon becomes putrid.

9. F. *ceranoides*, frond between coriaceous and membranaceous with a central rib linear subdichotomous pinnated with narrow lateral scattered multifid fruit-bearing branches, receptacles solitary terminal subcylindrical linear acuminated. *Turn. Hist. Fuc. t.* 89 (*not Lightf.*).

HAB. Rocks by the shore near the castle of Aros in Mull, *Mr. Turner* and *Hook.*

About 1 foot long.

10. F. *canaliculatus*, frond coriaceous linear nerveless channelled on one side dichotomous emarginate at the apices, receptacles terminal oblongo-cuneiform turgid bipartite obtuse. *Turn. Hist. Fuc. t.* 3. *Lightf. p.* 917. *E. B. t.* 823.

HAB. Rocky shores, Isle of Bute, &c., *Lightf.* Common in the Firth of Forth, *Mr. Greville.*

Three to 6 or 7 inches long. Well marked by its grooved *fronds.*

11. F. *loreus*, frond between cartilaginous and coriaceous compressed linear nerveless entire at the margins dichotomous arising from a peziza-shaped base, tubercles immersed in every part and on both sides of the frond. *Turn. Hist. Fuc. t.* 196. *Lightf. p.* 920. *E. B. t.* 569.

HAB. Sea-shores, not uncommon, *Lightf.* Dunbar, abundant, *Mr. Greville.* Westra, in Orkney, *Mr. Neill.*

From 2—10 feet long. The young plants have a curious appearance, are about an inch long, subgelatinous, turbinate, at length peziza-shaped; covering the rocks at low water for a great extent. Some I have seen on exposed rocks, probably from the effect of the sun, swollen into a large, hollow, perfectly sphærical ball.

22. LICHINA. *Ag.*

Fruit: a tubercle perforated at the extremity, at length scutelliform.—Habit shrubby and somewhat that of a Lichen.

1. L. *pygmæa*, frond cartilaginous compressed dilated upwards nerveless dichotomous, at its extremities palmated with very short truncated segments, tubercles terminal sessile sphærical perforated at the tips. *Ag. p.* 9. *Fucus pygmæus, Lightf. p.* 964. *t.* 32. *Turn. Hist. Fuc. t.* 204. *E. B. t.* 1332.

β. *minor*, frond nearly cylindrical. *Turn. Stereocaulon confine, Ach. Meth. Lich.* II. *p.* 317.

HAB. Rocks, not uncommon, at low water. First discovered by *Mr. Lightfoot* in Scotland, and described by him. β. Rocks at Dunbar, &c.

¼ to ½ an inch high, black.

23. SPOROCHNUS.

Fructiferous *tubercles* terminated by a pencil of hairs. The type of this genus is the English *Fucus pedunculatus. Frond* filiform, cartilaginous. *Fruit* oval or globose, with a pencil of conferva-like jointed deciduous threads at the extremity, within filled with concentric fibres, each terminated by a globule.

1. S. *aculeatus*, frond cartilaginous rounded very much branched,

branches plane filiform repeatedly divided in a pinnated manner scattered, the ultimate ones bearing pencils of hairs at length spiniferous, the spines approximate subulate straight. *Ag. p.* 10. *Fucus aculeatus, Lightf. p.* 924. *Turn. Hist. Fuc. t.* 187.

Hab. Sea-shores, not uncommon.

2—3 feet long, olivaceous brown when dry.

The fructification does not seem to be rightly known, and it is only from analogy that Agardh places it in this genus.

24. FURCELLARIA. *Lamour.*

Extremities of the frond swelling into closed *pericarps*.

1. F. *lumbricalis*, frond cartilaginous filiform dichotomous fastigiate, angles of the dichotomies acute, apices forked blunt, fruit in the elongated cylindrical acuminated apices. *Ag. p.* 10. *Fucus lumbricalis, Turn. Hist. Fuc. t.* 6. *E. B. t.* 824. *Fucus furcellatus, Lightf. p.* 932.

β. *fastigiatus*, apices compressed transparent ovato-lanceolate short acute. *Turn. F. fastigiatus, Lightf. p.* 930.

Hab. Sea-shores, frequent. Seafield rocks, Edinburgh, very fine, *Mr. Greville.*

6—9 inches long, purplish brown.

2. F.? *lycopodioides*, frond filiform mostly simple every where covered with closely imbricated filiform patent ramuli generally forked at their apices and swelling into lanceolate paniculated capsules. *Ag. p.* 11. *Fucus lycop., Turn. Hist. Fuc. t.* 12. *E. B. t.* 1163.

Hab. North of Scotland, *James Brodie, of Brodie, Esq.* Abundantly on the old stems of *F. digitatus*, at Seafield rocks, low tides, *Mr. Greville.*

Fronds many from the same base, 4—6 inches long, purplish brown, black when dry. Mr. Greville, besides the pod-like fruit here described, has had the good fortune to find globular *capsules*, such as Mr. Turner foretold the plant would be likely to have. It ill accords with this genus.

25. CHORDARIA. *Link.*

Fruit: subclavate jointed concentric filaments, among which the *seeds* are immersed.—A genus whose species accord sufficiently well in habit, and the fruit as far as known. *Fronds* filiform, cartilaginous, or lubricous, often covered with conferva-like hairs.

1. C. *rotunda*, frond cartilaginous filiform dichotomous fastigiated with the angles of the dichotomies rather obtuse, their extremities forked acute, capsules irregular lateral spongy not covered with an epidermis. *Turn. Ag. p.* 12. *Fucus rotundus, Turn. Hist. Fuc. t.* 5. *E. B. t.* 1738.

Hab. Caroline Park, *Mr. E. J. Maughan.* Rocks near Kirkcaldy, *Mr. Stewart.*

From 4—8 inches long, dark purplish brown.

2. C. *flagelliformis*, frond cartilaginous slimy cylindrical filiform branched, branches long mostly simple and distichous naked truncated, seeds naked immersed in the frond mixed with fibres. *Turn. Fucus flagellif., Lightf. p.* 928. *Turn. Hist. Fuc. t.* 85. *E. B. t.* 1222.

Hab. Sea-shores, frequent, as at Newhaven, &c., *Lightf.*

1—3 feet long, very slender, olive brown, almost black when dry.

3. C. *Filum*, frond cartilaginous slimy cylindrical filiform attenuated at both ends jointed internally, spirally twisted when old. *Turn. Ag. p.* 12. (*excl. his var. β.*) *Fucus Filum, Lightf. p.* 963. *Turn. Hist. Fuc. t.* 86.

Hab. Rocks, salt-water lakes and bays, abundant.

From 1—20 feet long, olive brown, covered with slimy minute conferva-like hairs. *Fructification* unknown.

4. C. *viridis*, frond cartilaginous filiform cylindrical repeatedly pinnated, branches and ramuli all opposite and capillary. *Turn. Ag. p.* 14. *Turn. Hist. Fuc. t.* 97. *E. B. t.* 1669.

Hab. Seafield rocks, not uncommon, and Firth of Forth, near Dysart, *Mr. Greville.* Coast of Morayshire, *Mr. Borrer* and *Hook.*

1—3 feet long. When fresh a beautiful orange colour, turning almost olive when dry.

26. LAMINARIA. *Lamour.*

Seeds oblong, immersed in portions (not upon the whole) of the frond. *Root* generally fibrous. *Stipes* distinct, supporting a costate or ribless, simple or palmated leaf. *Fruit* either in appendages attached to the stipes, as in *Lam. bulbosa* and *esculenta*, or here and there immersed in the proper frond. *Substance* cartilaginous, tough.

* *With a central rib.*

1. L. *esculenta*, frond membranaceous flat with a central rib simple ensiform entire at the margins supported upon a short cylindrical pinnated stipes, pinnæ fleshy distichous oblong flat nerveless containing numerous pyriform immersed seeds. *Turn. Ag. p.* 16. *Fucus esculentus, Lightf. p.* 938. *t.* 28. *E. B. t.* 1759. *Hook. in Fl. Lond. with a figure.*

Hab. Abundant on the shores of Scotland.

From 2—12, or even 20 feet in length, greenish brown. It is eaten both by men and cattle; the former prefer the midrib and reject the more membranaceous substance. This is recommended in the cure of a disorder called the *Pica*, to strengthen the stomach and restore the appetite. The common Scotch name is *Badderlocks.*

** *Ribless, coriaceous.*

2. L. *saccharina*, root fibrous long and branching, stipes almost woody cylindrical undivided expanding at its apex into a single cartilaginous flat simple linear oblong nerveless leaf entire at the margins, scattered seeds immersed in the leaf. *Turn. Ag. p.* 17. *Fucus saccharinus, Lightf. p.* 940. *Turn. Hist. Fuc. t.* 163. *F. phyllitis, Turn. Hist. Fuc. t.* 164, and *E. B. t.* 1331 (*young state*).

β. *bullata*, frond bullated in the centre, margins undulated. *Turn. Ulva latissima, Linn. F. saccharinus, E. B. t.* 1376.

Hab. Sea-coasts, abundant. β. Berriedale, in Caithness, *Mr. Borrer* and *Hook.* Common in the Firth of Forth, *Mr. Greville.*

This common species, which grows to the length of 6—7 feet, derives its specific name from its being, after it is steeped in fresh water and exposed to the sun, covered with a white efflorescence resembling sugar, but nauseous to the taste. It is not the "*saccharine Fucus*" of the Icelanders, as has been generally supposed: nor do I think it is eaten at all by the natives of that country. It is said, however, to be eaten in England by the poor, boiled as a potherb; but I know not whether it has been asserted by any person besides Pallas. Thunberg tells us, that in Japan it is prepared in such a manner as to be quite esculent, and that it is customary there, when presents are made, to lay upon them a slice of this *Fucus* attached to a piece of paper, folded in a curious manner, and tied with threads of gold and silver. Cattle eat it not unfrequently.

Mrs. Griffiths and Mr. Greville are satisfied, from the various observations they have been enabled to make on *F. saccharinus* and *F. phyllitis* in a growing state, that the latter is nothing but the young state of the former.

3. L. *digitata*, root fibrous, stipes woody cylindrical expanded at its apex into a single cartilaginous flat nerveless roundish leaf quite entire at its margins deeply cleft into numerous ensiform mostly simple segments. *Turn. Ag. p.* 18. *Fucus digitatus, Lightf. p.* 935. *Turn. Hist. Fuc. t.* 162.

Hab. Sea-shores, frequent.

From 2—12 feet, or more, in length, olive brown. This and all the larger kinds of *Fuci* are much used for manure. Occasionally specimens are found with the segments connected at the top, from which springs a new sessile frond; this *Mr. Greville* has met with in the Firth of Forth.

4. L. *bulbosa*, root hollow swollen into a bulb rough all over, stipes coriaceous flat twisted once at its origin its margins undulated in the lower part its apex expanded into a single cartilaginous flat nerveless leaf entire at its margins deeply cleft into numerous ensiform mostly simple segments, oblong seeds immersed in the margin of the stipes. *Turn. Ag. p.* 18. *Fucus bulbosus, Turn. Hist. Fuc. t.* 161. *E. B. t.* 1760. *Fucus polyschides, Lightf. p.* 936.

Hab. Scotch coast, but not plentiful; I-columb-kill, *Lightf.* At Losiemouth on the N. E. coast, *Jas. Brodie, of Brodie, Esq.*

3 to 6, or even 12, feet long, olive brown.

**** Frond membranaceous, ribless.*

5. L.? *ligulata*, frond between cartilaginous and membranaceous linear flat nerveless doubly pinnate, segments linear-lanceolate serrated at their margins with spinous teeth. *Turn. Fucus ligulatus, Lightf. p.* 946. *t.* 29. *Turn. Hist. Fuc. t.* 98. *E. B. t.* 1636.

Hab. Firth of Forth, about Newhaven, and other places, but not common, *Lightf.* Caroline Park, *Mr. E. J. Maughan.* Orkney Islands, *Mr. Chas. Cluaston.*

From 2—6 feet long, olive-green; orange by exposure to the air.

Div. V. Florideæ. *Lamour. Fruit capsuliform and immersed seeds, or both. Frond continuous, with interwoven longitudinal fibres. Substance coriaceous or membranaceous, or between gelatinous and cartilaginous. Colour purplish or rosaceous.—Root scutate. Stipes very short, soon spreading into a frond (except in the Delesseriæ). Leaves distinct in some, confluent with the rest of the parts in others, in some none. Frond either plane or filiform, rarely tubular. Vesicles none, and no conferva-like hairs.*

27. DELESSERIA.

Frond membranaceous. *Fruit* double. *Seeds* collected together in spots and immersed in the leaves; and *capsules.*—*Frond* very thin, reticulated (under a microscope), generally veined with regularity. *Fruit* naked seeds either in marginal processes or innate upon the nerve, or collected in spots here and there upon the frond.

* *Fronds or leaves veined.*

1. D. *sanguinea*, stem cylindrical branched supporting simple membranaceous petiolated leaves between oblong and ovate quite entire, the midrib producing sphærical pedunculated capsules and scattered leaves in oblong leafy processes. *Turn. Ag. p.* 21. *Fucus sanguineus, Lightf. p.* 942. *Turn. Hist. Fuc. t.* 36. *E. B. t.* 1041.

Hab. Sea-shores, not unfrequent.

A beautiful and delicate species with leaves from 4 to 6 or 8 inches in length, of a fine rose colour, with deeper coloured nerves.

2. D. *sinuosa*, stem cylindrical branched supporting oblong membranaceous leaves either sinuated or pinnatifid their margins crenate and ciliated, sphærical tubercles imbedded in the frond and scattered seeds in the cilia. *Turn. Ag. p.* 21. *Fucus sinuosus, Turn. H. F. t.* 35. *E. B. t.* 822. *Fucus rubens, Lightf. p.* 943.

Hab. Shores of Iona and other places, plentifully, *Lightf.* Coast of Moray, *Mr. Borrer* and *Hook.* Caroline Park, *Maugh.* Common in the Firth of Forth, *Mr. Greville.*

4—6 inches in length, and leaves 2—4 inches long. *Colour* a fine pink, with deeper nerves, dull red when dry, and, in decay, turning to a dirty yellow, tinged with green.

3. D. *alata*, frond membranaceous extremely tender midribbed linear subdichotomous, the segments alternately pinnated, sphærical sessile tubercles and naked scattered seeds both placed sometimes on the apices of the branches and sometimes on oblong processes originating from the midrib. *Turn. Ag. p.* 22. *Fucus alatus, Lightf. p.* 951. *Turn. Hist. F. t.* 160. *E. B. t.* 1837.

HAB. Upon sea-rocks, frequent, in basins of water left by the recess of the tide, *Lightf.*

Fronds 4—6 inches long. *Colour* a deep red rose colour, with very dark veins.

4. D. *lacerata*, frond membranaceous very tender plane veiny mostly dichotomous, branches sublinear their apices rounded margins lacinulated and waved, hemisphærical tubercles immersed in the frond and naked seeds collected into oblong clusters. *Fucus laceratus*, *Turn. Hist. Fuc. t.* 68. *E. B. t.* 1067. *F. endiviifolius*, *Lightf. p.* 948. *t.* 32.

HAB. Firth of Forth and the coast of Iona, *Lightf.* Orkney, *Mr. Chas. Clauston.*

Rose colour, sometimes inclining to tawny; 4—6 inches long.

** *Veinless.*

5. D. *coccinea*, frond compressed between membranaceous and cartilaginous much and irregularly branched, ramuli subulate disposed in alternate parcels of three or four each, sphærical sessile capsules and lanceolate pods. *Turn. Fucus coccineus*, *Turn. Hist. Fuc. t.* 59. *E. B. t.* 1242. *Fucus Plocamium*, *Lightf. p.* 957.

HAB. Sea-rocks, in basins of water left by the recess of the tide, frequent, *Lightf.*

From 3 to 6 inches, or even a foot long, very much branched, crimson.

6. D. *punctata*, frond membranaceous very tender flat nerveless mostly dichotomous, segments nearly linear bifid and obtuse at their apices, at their margins flat and entire, hemisphærical immersed tubercles scattered all over the frond and naked seeds collected into oblong spots. *Turn. Fucus punctatus*, *Turn. Hist. Fuc. t.* 71. *E. B. t.* 1573.

HAB. Upon the shore at Wick, in Caithness, among rejectamenta, *Mr. Borrer* and *Hook.*

From 2 to 6 inches long, and from 1 to 2 or 3 inches broad, pink coloured, or sometimes almost red, very thin and membranous, and elegantly spotted with fructification, reticulated.

7. D. *ulvoides*, frond membranaceous very tender flat nerveless lobed, lobes obtuse flat and quite entire at their margins, tubercles hemisphærical umbonated immersed in the frond and scattered all over it. *Turn. Fucus ulvoides*, *Turn. Hist. Fuc. t.* 80. *E. B. t.* 2134.

HAB. Shores of Moray, *James Brodie, of Brodie, Esq.* Orkney Islands, *Mr. Chas. Clauston.*

3 or 4 inches long, of a broadly ovate figure, almost orbicular, reddish rose colour.

28. SPHÆROCOCCUS.

Fruit uniform, *capsules*.—*Fronds* confluent in all their parts, plane or filiform, nerveless, cartilaginous. *Fruit* tubercles or capsules sessile upon the disk of the frond, or marginal and pedicellate.

* *Frond plane or compressed.*

1. S. *dentatus*, frond flat membranaceous branched alternately pinnatifid, ramuli alternate linear sharply toothed at the apices, capsules pedunculate axillary lanceolate and urceolate. *Turn. Ag. p.* 22. *Fucus dentatus, Lightf. p.* 952. *Turn. Hist. Fuc. t.* 13. *E. B. t.* 1241.

Hab. Firth of Forth, Iona, and other shores, plentifully.

From 5 inches to a foot long, dark reddish brown, opaque.

2. S. *rubens*, frond membranaceous obsoletely ribbed proliferous from the surface, branches elliptical simple and forked, roundish peltate leaves and hemisphærical externally uneven tubercles sessile on the disk. *Turn. Ag. p.* 23. *Fucus rubens, Turn. Hist. Fuc. t.* 42. *E. B. t.* 1053. *Fucus prolifer, Lightf. p.* 949. *t.* 30.

Hab. Shores of the western coast, adhering to shells and stones, *Lightf.* Rare and only among rejectamenta in the Firth of Forth, *Mr. Greville.*

3—7 inches long, fine reddish rose colour, approaching to purplish.

3. S. *crispus*, frond cartilaginous flat nerveless dichotomous, entire at the margins curled segments subcuneiform the uppermost narrowest, tubercles roundish solitary scattered immersed in the substance of the frond concave on one side deciduous. *Turn. Ag. p.* 24. *Fucus crispus, Turn. Hist. Fuc. t.* 216 and 217. *Fucus ceranoides, Lightf. p.* 913.

γ. *stellatus*, frond submembranaceous, branches dilated upwards divided at their apices into very numerous clustered shortish laciniæ. *Turn.*

δ. *æqualis*, frond cartilaginous thick, all the branches equal and linear, the extreme segments obtuse. *Turn. F. crispus, E. B. t.* 2285.

Hab. Rocky shores, α. and γ. plentiful. δ. Firth of Forth, *Mr. Greville.* A most variable species both in form and in colour. From 3 to 6 inches high, usually of a purplish or reddish cast, often inclining to green, especially in decay.

4. S. *mammillosus*, frond cartilaginous channelled on one side nerveless dichotomous elongato-cuneiform proliferous from the sides and surface entire at the margins, tubercles sphærical all over the frond on very short peduncles. *Turn. Ag. p.* 25. *Fucus mammillosus, Turn. Hist. Fuc. t.* 218. *E. B. t.* 1054. *Fucus ceranoides* ε., *Lightf. p.* 916.

β. *linearis*, frond narrow linear, apices bluntish and emarginate. *Turn. Fucus ceranoides* ζ., *Lightf. p.* 917.

Hab. Rocky shores, frequent. ζ. On the Cramond Island, *Lightf.*

3—6 inches long, very variable in width upwards. *Colour* purplish red.

5. S. *membranifolius*, stipes cylindrical branched, apices expanded into a subcuneiform leaf between membranaceous and cartilaginous flat nerveless bilobed or dichotomous, tubercles oblong

pedunculated growing on the stem. *Turn. Ag. p.* 26. *Fucus membranifolius, Turn. Hist. Fuc. t.* 74. *E. B. t.* 1965.

β. lacer, leaves dichotomous, segments linear, apices acute. *Turn. F. ceranoides γ., Lightf. p.* 915.

δ. fimbriatus, leaves fringed at the margin. *Turn. F. ceranoides δ., Lightf. p.* 916.

HAB. Firth of Forth, not uncommon, *Mr. Greville*[a].

4—6 inches high, of a reddish purple colour.

6. S. *Brodiæi*, stipes cylindrical branched its apex expanded into a leaf between membranaceous and cartilaginous oblong simple or forked flat nerveless proliferous from its margin, tubercles sphærical sessile upon the apices of the leaf. *Turn. Ag. p.* 27. *Fucus Brodiæi, Turn. Hist. Fuc. t.* 72. *E. B. t.* 1966.

HAB. Losie-mouth, *Jas. Brodie, of Brodie, Esq.* Half-way between Newhaven and Caroline Park, *Mr. Stewart* and *Mr. Greville.*

6—8 inches tall, of a very deep red purple colour.

7. S. *Sarniensis*, frond submembranaceous flat without midrib laciniated in a palmated manner proliferous from its margin, segments linear, tubercles sphærical immersed. *Turn. Fucus Sarniensis, Turn. Hist. Fuc. t.* 44. *E. B. t.* 2132.

HAB. Scotch coast, *Dr. Walker.* Orkney Islands, *Mr. Chas. Clauston.*

Fronds from 6 inches to 1 foot long, purplish, darker when dry. *Tubercles* minute, dispersed without order.

8. S. *ciliatus*, frond between membranaceous and cartilaginous flat nerveless generally lanceolate branched in a pinnated manner ciliated at its margins and surface, cilia mostly simple patent subulate producing tubercles at their apices. *Turn. Ag. p.* 28. *Fucus ciliatus, Turn. Hist. Fuc. t.* 70. *E. B. t.* 1069. *Lightf. p.* 944.

ε. lanceolatus, frond lineari-lanceolate narrow much and irregularly branched, cilia long compressed linear acuminated branched. *Turn. F. ciliatus β., Lightf. p.* 946.

HAB. Shores of Iona, and other places, but not common, *Lightf.*

From 4—6 inches long, purplish red. Eaten, according to Lightfoot, with the true Dulse.

9. S.? *laciniatus*, frond between cartilaginous and membranaceous flat nerveless branched, branches dilated upwards palmate and blunt at their apices their margins flat crenate and proliferous, immersed hemisphærical tubercles in the marginal processes

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[a] "It is a curious fact," Mr. Greville observes in a letter to me, "that wherever any striking var. of *F. crispus* is predominant, *F. mammillosus* is sure to be found assuming the same characters, as far as they relate to size and form. This I have not only noticed on this coast, but on the north and south coasts of Devon. On the Tor Abbey rocks var. *β.* of *F. crispus* (not, however, of a green colour) grows abundantly, and every plant of *F. mammillosus* in the immediate vicinity bore the same appearance: and that var. of *F. crispus* is one of the best marked and most constant."

and naked seeds scattered all over the frond. *Turn. Fucus laciniatus, Lightf. p.* 947. *Turn. Hist. Fuc. t.* 69. *E. B. t.*1068.

Hab. Coasts of Iona, &c. plentifully. Orkney, *Mr. Chas. Clauston.* Rare at Dunbar; more common near Berwick, *Mr. Greville.*

3—6 inches high, rather bright red. This should be perhaps removed to *Delesseria,* if the genera be really distinct.

10. S. *cristatus,* frond membranaceous flat veinless subdichotomous, branches alternate decurrent somewhat dilated upwards cleft at the apices, segments short obtuse bearing small globular sessile capsules. *Turn. Ag. p.* 29. *Fucus cristatus, Turn. Hist. Fuc. t.* 23.

β. *Valentiæ,* branches all linear, tubercles both lateral and terminal. *Turn.*

Hab. β. On the sea-shore at Wick, Caithness, *Mr. Borrer* and *Hook.*

About 2 inches long, pinky scarlet.

11. S. *corneus,* frond between cartilaginous and corneous compressed nerveless irregularly branched, branches linear attenuated at each end bipinnate, pinnæ opposite patent obtuse bearing at their apices elliptical capsules. *Turn. Fucus corneus, Turn. Hist. Fuc. t.* 257. *E. B. t.*1970.

β. *filicinus,* frond setaceous, pinnæ horizontal widened very blunt. *Turn. F. nereidus, Lightf. p.* 957.

Hab. Firth of Forth and other places, but not common, *Lightf.*

Very variable in form and size, from 1 inch to 6 or 8 inches, and generally of a deep reddish purple colour.

*** *Frond filiform, rounded.*

12. S. *purpurascens,* frond filiform irregularly branched, ramuli setaceous scattered bearing sphærical tubercles immersed in their substance. *Turn. Ag. p.* 31. *Fucus purpurascens, Turn. Hist. Fuc. t.* 9. *E. B. t.* 1243. *F. tuberculatus, Lightf. p.* 926.

Hab. Upon the shores, frequent.

From 9 inches to 1 foot long, purplish, subdiaphanous, often greenish in decay.

13. S. *subfuscus,* frond filiform much and irregularly branched, ramuli subulate pinnated subalternate, capsules axillary panicled both lanceolate and sphærical. *Turn. Ag. p.* 32. *Fucus subfuscus, Turn. Hist. Fuc. t.* 10. *E. B. t.* 1164.

Hab. Near Nether Cramond, *Maugh.;* not uncommon.

6—8 inches high, purplish brown.

14. S. *plicatus,* frond horny slender filiform of equal size throughout irregularly dichotomous beset with clustered entangled horizontal mostly simple branches generally pointing in the same direction, apices obtuse, tubercles irregularly hemisphærical sessile. *Turn. Ag. p.* 34. *Fucus plicatus, Turn. Hist. Fuc. t.* 180. *Lightf. p.* 929. *E. B. t.* 1089.

Hab. Upon the sea-shores in many places, as about Newhaven, *Lightf.* Fife coast, *Mr. Greville.*

3—4 or 6 inches long, generally dark purple, but often bleached by exposure on the beach.

29. CHONDRIA.

Frond between gelatinous and cartilaginous. *Fruit* double. *Seeds* naked, immersed in the branches, and *capsules* containing pyriform *seeds.*—*Frond* filiform, generally equal throughout, branched. *Colour* reddish, soon becoming pale.

1. Ch. *obtusa*, frond subcartilaginous cylindrical filiform repeatedly pinnated, branches generally opposite, ramuli cylindrical short between horizontal and patent truncated, capsules ovate sessile and naked seeds on the ramuli. *Turn. Ag. p.* 35. *Fucus obtusus, Turn. Hist. Fuc. t.* 21. *E. B. t.* 1201.

HAB. Rare, Firth of Forth, *Mr. Stewart* and *Mr. Greville.*

3—6 inches tall. *Colour,* a pinky yellow, very fugitive.

2. Ch. *pinnatifida*, frond compressed subcartilaginous branched, branches mostly alternate doubly pinnatifid, ramuli obtuse callous, capsules ovate sessile and naked seeds on the ramuli. *Turn. Fucus pinnatifidus, Lightf. p.* 953. *Turn. Hist. Fuc. t.* 20. *E. B. t.* 1202.

β. *Osmunda*, frond flat generally undivided, ramuli short and multifid, *Turn. F. filicinus, Lightf. p.* 954.

HAB. Rocky shores, common. β. with α.

Three to seven or nine inches high, livid purple, pale.

3. Ch. *ovalis*, frond subgelatinous nearly cylindrical filiform irregularly dichotomous naked below in its upper part clothed with elliptical simple ramuli imbricated on all sides bearing naked scattered seeds and hemisphærical sessile tubercles. *Turn. Fucus ovalis, Turn. Hist. Fuc. t.* 81. *E. B. t.* 711. *Fucus vermicularis, Lightf. p.* 958.

HAB. Basins of water upon marine rocks, but not common. Little Isles of Jura, *Lightf.*

Three to seven inches long, reddish purple. The ramuli are admirably compared by Lightfoot to the leaves of *Sedum album.*

4. Ch. *dasyphylla*, frond filiform cylindrical branched in an irregularly pinnated manner, branches between horizontal and patent mostly simple, ramuli cylindrical scattered attenuated at the base proliferous, capsules ovate sessile, and naked seeds on the ramuli. *Turn. Fucus dasyphyllus, Turn. Hist. Fuc. t.* 22. *E. B. t.* 847.

HAB. Losie-mouth, *James Brodie, of Brodie, Esq.*

Three to six inches long. *Colour* pale, pinky brown.

5. Ch. *clavellosa*, frond subgelatinous filiform cylindrical tubular much and irregularly branched, branches and ramuli mostly alternate and distichous, tubercles sessile and scattered seeds on the ramuli. *Turn. Fucus clavellosus, Turn. Hist. Fuc. t.* 30 (*bis*). *E. B. t.* 1203.

β. *sedifolius*, ramuli between oblong and oval crowded undivided. *Turn.*

Hab. Firth of Forth, rather rare, *Mr. Greville.* β. Losie-mouth, *James Brodie, of Brodie, Esq.*, abundant.

Three to seven inches in length; of a pale red colour.

6. Ch. *kaliformis*, frond subgelatinous filiform tubular much and irregularly branched, branches and ramuli generally verticillate contracted as if jointed, tubercles sessile and scattered seeds on the ramuli. *Turn. Fucus kalif., Turn. Hist. Fuc. t.* 29 (*bis*). *E. B. t.* 640. *F. verticillatus, Lightf. p.* 962. *t.* 31.

Hab. Sparingly on the rocks of the little Isles of Jura, *Lightf.* Western coast of Scotland, *Mr. Menzies.*

Six inches to a foot or more long. *Colour* a beautiful pink, very fugitive.

7. Ch. *Opuntia*, frond subcylindrical filiform solid here and there contracted as if jointed branched, with a net-work of fibres internally, branches horizontal acuminated, joints lanceolate obsolete, tubercles globular very minute scattered. *Turn. Fucus Opuntia, Turn. Hist. Fuc. t.* 107. *Fucus repens, Lightf. p.* 961. *Rivularia Opuntia, E. B. t.* 1868.

Hab. Rocky shores, common.

Thickly matted, from half an inch to an inch long.

8. Ch. *pusilla*, frond between cartilaginous and horny flat filiform here and there contracted as if jointed much and irregularly branched, ramuli horizontal attenuated at their base dilated and rounded at their apices, very minute globular sessile tubercles and scattered seeds upon the ramuli. *Turn. Fucus pusillus, Turn. Hist. Fuc. t.* 108.

Hab. Caroline Park, Firth of Forth, *Mr. Greville.*

Minute, from half an inch to an inch or more in length, purplish pink.

9. Ch. *articulata*, frond cylindrical filiform tubular contracted throughout as if jointed branched, branches of equal height dichotomous and whorled, joints subcylindrical, tubercles urceolate sessile and scattered seeds on the ramuli. *Turn. Fucus articulatus, Lightf. p.* 959. *Turn. Hist. Fuc. t.* 106. *E. B. t.* 1574.

Hab. Marine rocks in Jura, Oransa, Canay, Skye, &c., *Lightf.* Firth of Forth, not uncommon, *Mr. Greville.* Orkney, *Mr. Chas. Clauston.*

Three to four inches to one foot in length. *Colour* purplish pink.

30. PTILOTA. *Ag.*

Seeds naked, surrounded by an involucrum.—*Frond* compressed, nerveless, pinnated. *Seeds* collected into a cluster and inclosed in a setaceous *involucrum.*

1. Pt. *plumosa*, frond compressed cartilaginous much and irregularly branched, branches repeatedly pinnated, ramuli oppo-

site bearing the fruit at their apices, seeds naked surrounded by the quadrifid ends of the ramuli. *Turn. Ag. p.* 39. *Fucus plumosus, Lightf. p.* 955. *Turn. Hist. Fuc. t.* 60. *E. B. t.* 1308.

β. *capillaris*, frond very narrow nearly cylindrical jointed, *Turn.*

Hab. Coast of Iona, and other shores, not uncommon, *Lightf.* Firth of Forth, *Maugh.* and *Mr. Greville.* β. Losie-mouth, *James Brodie, of Brodie, Esq.*

Three to six inches long. *Colour* a deep purplish red, inclining to brown.

31. HALYMENIA.

Frond between membranaceous and coriaceous. *Seeds* dispersed in spots and immersed throughout the whole frond.—*Frond* membranaceous or sometimes coriaceous, plane or tubular, nerveless. Allied to the *Ulvæ;* but the substance is thicker and the colour and fibrous texture are different.

* *Fronds plane.*

1. H. *edulis*, frond cartilaginous plane nerveless simple cuneiform quite entire rounded at the apex attenuated at the base into a very short cylindrical petiole, solitary seeds scattered all over the frond. *Turn. Fucus edulis, Turn. Hist. Fuc. t.* 114. *E. B. t.* 1307. *Hook. in Fl. Lond. with a figure. Fucus palmatus* β., *Lightf. p.* 935.

Hab. Not uncommon in the Firth of Forth, *Mr. Greville.*

Appears to be eaten as well as the following. It is from 4 to 6 or 8 inches tall, deep brownish purple, tough and rather leathery.

2. H. *palmata*, frond membranaceous plane nerveless palmated quite entire at the margin, segments oblong mostly simple, seeds naked collected into wide irregularly shaped spots scattered all over the frond. *Turn. Ag. p.*36. *Fucus palmatus, Turn. Hist. Fuc. t.* 115. *E. B. t.* 1306. *Hook. in Fl. Lond. with a figure. Lightf. p.* 933. *t.* 27.

Hab. Abundant on all the rocky shores.

Four to six inches to a foot high, of a livid purplish colour. This is the *Dulse* of the Scotch, who are very fond of it in a fresh and crude state. Lightfoot says, however, that they prefer it dried and rolled up, when they chew it like tobacco for the pleasure arising from the habit. This is the *saccharine Fucus* of the Icelanders, the efflorescence of which has a sweetish and not disagreeable taste. It is dried by the natives, packed down in casks, and used as occasion requires, frequently cooked with butter. Cattle, sheep in particular, often eat this species with eagerness, whence it has been called *Fucus ovinus.*

3. H. *sobolifera*, frond membranaceous flat without midrib laciniated in a palmated manner proliferous from the margin, segments dilated upwards the extreme ones gashed at their apices

with numerous short subsetaceous teeth. *Turn. Ag. p.* 36. *Fucus soboliferus, Turn. Hist. Fuc. t.* 45.

Hab. Orkney islands, *Mr. Charles Fothergill, Mr. Borrer* and *Hook.*

Three to four inches long, of a transparent pinky colour.

** *Frond cylindrical.*

4. H.? *subtilis*, fronds subgelatinous capillary branched, branches growing irregularly in parcels on different sides of the frond rather remote acuminated. *Turn. H. fœniculacea, Ag. p.* 38. *Fucus subtilis, Turn. Hist. Fuc. t.* 234. *Conferva fœniculacea, Lightf. p.* 981.

Hab. In basins of water left by the recess of the tides, among the rocks on the western coast, *Lightf.* Abundant on the shores of Iona, and at Oban, *Mr. Turner* and *Hook.*

One to two feet long; branches very fine and conferva-like, but quite destitute of joints. *Colour* olive brown. No fructification has been discovered.

Order IV. CHARACEÆ.

Fructification of two kinds. *Nucules* 4, bracteated, standing solitary, sessile, oval, spirally striated, surrounded by a diaphanous covering or *involucre*, which is obscurely quinquefid at the extremity, one-celled, many-seeded, indehiscent: *seeds* or *sporules* very minute, whitish, sphærical; and *globules* of a reddish or orange colour, accompanying the *Nucules*, surrounded by a pellucid coat or covering, at length opening into 3—4 valves, and containing a mass of very minute spiral filaments.

Vegetation. Aquatic plants never rising above the surface of the water, fixed into the mud by slender fibrous radicals issuing from a swollen portion of the base of the stem. *Stems* slender, confervoid, (always?) tubular throughout, pellucid or covered with a calcareous crust, very brittle when dry and generally fœtid, branched; branchlets whorled, often aculeated, *Wallroth, Annus Botanicus.*—Wallroth, in his little work here referred to, has given a most admirable account of the fructification of this curious tribe of plants; from which it appears evident, that it has no claims to be ranked among the perfect plants, and that its nearest affinity is with the *Confervæ* and *Ulvæ* among the *Algæ.*

A minute fossil body frequently found in chalk, which is spirally twisted, and which was formerly considered to belong to the animal kingdom, is, I believe, now generally allowed to be the *Nucule* of *Chara.* Various species have been discovered, and they are called by the French, *Gyrogonites.* M. Leman, however, (who speaks of them in the *Nouveau Dict. des Sciences Naturelles*, under the article *Charagne*,) from an investigation of them in the fossil state, comes to a different conclusion from that of Wallroth, and says they are allied to the *Onagrariæ* and *Salicariæ*, and proposes that the genus *Chara* should constitute a new family of *Dicotyledons*, under the name of *Eleodeæ*.

1. CHARA.

1. Ch. *flexilis*, stems pellucid glabrous and unarmed flaccid much branched, branches opposite patent, whorls of branchlets 6—8 di-trichotomous at the extremity or simple obtuse, nucules few scarcely bracteated. *Lightf. p.* 536. *E. B. t.* 1070, and *t.* 2140 (*Ch. gracilis? Wallr. An. Bot. p.* 176).

HAB. Lakes, rivers, and ditches, abundant, *Lightf., Hopk., Don.*

2. Ch. *translucens*, "smooth transparent without prickles, leaves cylindrical obtuse with a small point all simple with transverse internal partitions." *Sm. E. B. t.* 1855.

HAB. Ditches about Edinb.; Kinross-shire, Highlands, &c., *Mr. Arnott.* Restenart Marsh, near Forfar, *D. Don.*

Wallroth is disposed to consider the *Ch. translucens* of Vaillant and *E. Bot.* a var. of *Ch. vulgaris*; but he says the *stems* and *branches* are "roughish;" from which it would appear he is not acquainted with our plant, for it is remarkably smooth, and by far the largest of the genus. It is, however, very difficult to draw correctly the line of distinction between the different species of *Chara*.

3. Ch. *vulgaris*, stems branched rounded roughish, whorls of branchlets about 8 linear-subulate rather acute, bracteas about 4. *Lightf. p.* 535. *E. B. t.* 336.

HAB. Ditches and slow streams.

4. Ch. *hispida*, stems branched excessively brittle below unarmed spirally striated above much aculeated, spines or teeth often pointing downwards, whorls of about 8 simple branchlets acute with numerous setaceous bracteas placed in fours. *Lightf. p.* 535. *E. B. t.* 463.

HAB. Ditches and lakes. Guillon Loch, *Dr. Parsons.* Restenat Marsh, *D. Don.* Lismore, *Capt. Carmichael.*

Covered apparently with an earthy or calcareous whitish *crust*, rendering the whole plant excessively fragile. Even the exposure to the air and light, when this plant is thrown out of the ditches, soon reduces it to a mere dust.—M. Bosc observes that fish, and especially carp, thrive best when the species of *Chara* abound:—probably because they harbour a number of insects, which are the food of these fish.

ORDER V. HEPATICÆ. *Juss. Decand.*

(*Part of Algæ, Linn. Calyptratæ Deoperculatæ, Mohr.*)

Fructification generally of two kinds. *Capsules* in an early stage covered with a *calyptra*, tipped with a *style* (?),—and then often surrounded by a *perianth* or *calyx*, at length bursting the *calyptra* irregularly, and rising on a *peduncle* (except in *Riccia*), and opening at the extremity into 2 or 4 equal *valves*, destitute of *operculum*, bearing within numerous *seeds* mixed with spiral *filaments*:—and oblong or mostly rounded, and frequently shortly pedunculated, reticulated bodies, *anthers* (?), containing a very minutely granulated substance which escapes by an aperture formed at the extremity.—*Minute plants* frequently frondose, sometimes (as in *Jungermannia*), foliiferous; the *leaves* often divided, never really nerved. *Substance* loosely cellular in general, easily reviving, after being dried, by moisture. Sometimes the *areolæ* of the *cells* have an evident *pore*, as in *Marchantia* and *Targionia*.

1. RICCIA.

Capsule sphærical, immersed in the *frond* (not opening ?), crowned with the *style* which is alone protruded. I am but imperfectly acquainted with the *fructification* of the plants attributed to this genus. In *R. glauca* I can discover no *calyptra*, and were it not that its herbaceous texture assimilates it with the *Hepaticæ*, it would be hard to distinguish it from the genus *Endocarpon* among the *Lichens*. Only one kind of *fructification* has ever been discovered; upon some of the British species indeed, *R. natans* and *fluitans*, none.

1. R. *glauca*, frond small oblong somewhat divided, the segments two-lobed at the extremity fleshy glaucous dotted on the surface and slightly channelled with the fructifications near the base. *Lightf. p.* 709. *E. B. t.* 2546.

HAB. Rocks slightly covered with earth at the Tarbet of Cantire, &c., *Lightf.*

Frequently growing in a radiating or stellated manner in patches of half an inch long.

2. R. *spuria*, "fronds membranaceous lobed pellucid, fructifications beneath the sinuses of the lobes solitary exserted turbinate toothed." *Dicks. Plant. Crypt. fasc.* 4. *p.* 20. *t.* 11. *f.* 16.

HAB. Turfy marshes among the Scotch mountains, *Dickson.*

Of this plant I know nothing but from Dickson's figure and description above quoted. It seems very ill to accord with *Riccia.*

2. ANTHOCEROS.

Capsule pedunculated, linear, two-valved, with a central *columella*, to which the *seeds* are attached.

1. A. *multifidus*, fronds bipinnatifid linear. *Dicks. Pl. Crypt. fasc.* 3. *p.* 13. *Dill. Musc. t.* 68. *f.* 4.

HAB. Crevices of rocks in the Highlands, *Dickson.*

With this plant of Mr. Dickson's also I am unacquainted, nor is it taken up in *E. Bot.*

3. JUNGERMANNIA.

Common receptacle of the *fruit* none. *Perianth* or *calyx* monophyllous, tubular (rarely wanting). *Capsule* 4-valved, terminating a peduncle which is longer than the *perianth.*

A. *Leafy.*

† *Stipules none.*

a. *Leaves inserted on all sides.*

1. J. *trichophylla*, stem creeping irregularly branched, leaves imbricated on all sides here and there fasciculated setaceous jointed patent straight, fruit terminal, cal. oblong the mouth contracted ciliated. *Hook. Jung. t.* 7.

HAB. Moist rocky places. On Craig-alleach and Schechallion in Breadalbane, Perthshire, and on Ben Luyal, in the N. of Sutherland, *Hook.*

2. J. *setacea*, stem creeping branched in a somewhat pinnated manner, leaves imbricating on all sides binous setaceous jointed patent incurved, fruit terminal on proper short branches, cal. oblong, the mouth expanded ciliated. *Hook. Jung. t.* 8. and *Suppl. t.* I.

HAB. Auchindenny woods, Edinb., *Mr. Greville.*

3. J. *julacea*, stem nearly erect irregularly branched filiform, leaves quadrifarious ovate closely imbricated erect acutely bifid, the segments lanceolate acuminate subserrate those of the perichætium 4-partite, fruit terminal, cal. oblong plicate above, the mouth open toothed. *Hook. Jung. t.* 2. *Lightf. p.* 785.

β. *gracilis*, stems elongated, leaves small rather distant.

HAB. Summits of Ben Lomond, the Breadalbane and other mountains, plentiful. β. On Ben Nevis, *Hook.*

Grows in large, dense, compact tufts, with frequently a white hoariness upon it.

4. J. *juniperina*, stem erect flexuose subsimple elongated filiform, leaves quadrifarious falcato-secund linear-lanceolate bipartite, the segments straight acuminate, fruit terminal, cal. ovate leafy. *Hook. Jung. t.* 4.

HAB. Scotch mountains, plentifully, as Ben Lomond, Cairn-gorum, Ben Nevis, Ben Lawers, Ben Arthur, Ben-y-caillich in Skye, &c.:—but the finest specimens I ever saw (almost 1 foot long) were by a cascade in a glen near the head of Loch Lomond.

Growing in large tufts of a fine yellow brown colour.

5. J. *Hookeri*, stem erect somewhat branched, leaves imbricated on all sides ovate or oblongo-ovate here and there lobed or angled, fruit terminal, cal. none, calyptra large oblong fleshy smooth, capsule oblong. *Hook. Jung. t.* 54.

Hab. Marshy ground at Kinnordy, Kerriemuir, *Charles Lyell, Esq.*

b. *Leaves bifarious.*

* *Leaves undivided.*

6. J. *asplenioides*, stem ascending branched, leaves obovato-roundish ciliato-dentate subrecurved, fruit terminal and lateral, cal. oblong compressed oblique, mouth truncated subciliated. *Hook. Jung. t.* 14. *Lightf. p.* 771.

Hab. Woods and shady places, plentiful.

7. J. *spinulosa*, stem erect branched, leaves obovate recurved with the margin on one side and the apex dentato-spinulose, fruit lateral and axillary, cal. roundish compressed, the mouth truncated ciliated. *Hook. Jung. t.* 14.

Hab. Mountainous parts of Scotland among rocks, not uncommon.

8. J. *pumila*, stem ascending nearly simple, leaves elliptical ovate, fruit terminal, cal. oblongo-ovate acuminate, mouth contracted denticulated. *Hook. Jung. t.* 17.

Hab. On the ground, Kinnordy, Kerriemuir, *Mr. Lyell.*

9. J. *lanceolata*, stem procumbent subsimple, leaves patent ovato-rotundate, fruit terminal, cal. oblongo-cylindrical depressed and flat at the extremity, the mouth much contracted cut and toothed. *Hook. Jung. t.* 18. *Lightf. p.* 773.

Hab. Moist, shady banks, and on the rotten trunks of trees, *Lightf.* Near Newburgh, on the Cathkin hills, *D. Don.*

10. J. *cordifolia*, stem erect flexuose dichotomous, leaves erect concave cordate circumvolute, fruit terminal and axillary, cal. oblongo-ovate subplicate, mouth minute toothed. *Hook. Jung. t.* 32.

Hab. Highland mountains in many situations. Isla and Catlaw, Angus-shire, *Mr. Lyell.*

11. J. *Sphagni*, stem procumbent nearly simple (the gemmiferous elongations of the stem alone having stipules), leaves orbicular, fruit upon short proper branches, cal. oblong attenuated at each extremity, the mouth contracted toothed. *Hook. Jung. t.* 33, and *Suppl. t.* 2.

Hab. Bogs near Forfar and Newburgh, Fifeshire, *D. Don.*

12. J. *crenulata*, stem procumbent branched, leaves orbicular margined, fruit terminal, cal. obovate compressed longitudinally quadrangular, the mouth contracted toothed. *Hook. Jung. t.* 37.

Hab. Marshy places, Kinnordy, *Mr. Lyell.*

** *Leaves emarginate or bifid, the segments equal.*

13. J. *emarginata*, stem erect branched, leaves loosely imbricated patent obcordate emarginate, fruit terminal, cal. ovate toothed immersed in the leaves. *Hook. Jung. t.* 27.

Hab. Moist places among rocks, abundant, especially in alpine situations.

14. J. *concinnata*, stem erect branched, leaves very closely imbricated erect concave ovate obtuse emarginate, fruit terminal, cal. none. *Lightf. p.* 786. *Hook. Jung. t.* 3.

Hab. Summits of the mountains, Ben Lawers, Ben Lomond, &c.

15. J. *orcadensis*, stem erect simple, leaves closely imbricated erect or patent cordato-ovate plane notched at the extremity their margins recurved. *Hook. Jung. t.* 71.

Hab. Wart hill of Hoy, Orkney, near the summit, *Hook.* Catlaw, near Kinnordy, *Mr. Lyell.*

16. J. *inflata*, stem procumbent simple or branched, leaves roundish concave acutely bifid, segments straight obtuse, fruit terminal, cal. obpyriform, the mouth contracted toothed. *Hook. Jung. t.* 38.

Hab. Moist places, not uncommon.

17. J. *excisa*, stem prostrate nearly simple, leaves patent subquadrate deeply emarginate, fruit terminal, cal. oblong, the mouth plicate toothed. *Hook. Jung. t.* 9.

Hab. Highland mountains, frequent, *Hook.* Marshes, common, *D. Don.*

18. J. *ventricosa*, stem prostrate somewhat branched, leaves patent subquadrate obtusely and broadly emarginated their sides incurved, fruit terminal, cal. oblong, the mouth contracted plicated toothed. *Hook. Jung. t.* 28.

Hab. Moist shady places, among rocks, and in woods.

19. J. *bicuspidata*, stem procumbent branched in a stellated manner, leaves subquadrate acutely bifid, the segments acute straight entire, fruit terminal, cal. oblong plicated, the mouth toothed. *Hook. Jung. t.* 11. *Lightf. p.* 775.

Hab. Woods, heaths, &c., abundant.

20. J. *byssacea*, stem procumbent branched in a stellated manner, leaves subquadrate obtusely bifid, the segments acute, fruit terminal, cal. oblong plicate, the mouth toothed. *Hook. Jung. t.* 12.

Hab. Highland mountains, in exposed situations, not uncommon.

21. J. *connivens*, stem procumbent branched in a stellated manner, leaves orbicular concave at the extremity lunulato-emarginate, fruit terminal upon short proper central branches, cal. oblongo-ovate, the mouth ciliated. *Hook. Jung. t.* 15.

Hab. Marshes and mountains, frequent.

22. J. *curvifolia*, stem procumbent branched in a stellated manner, leaves roundish very concave bifid, the segments long acuminate incurved, fruit terminal upon short proper branches, cal. oblong subplicate, the mouth toothed. *Hook. Jung. t.* 16.

Hab. Highland mountains, *Dickson.* On Ben Nevis; Ross-shire mountains, &c., *Hook.*

*** *Leaves tri-quadrifid, the segments equal.*

23. J. *incisa*, stem prostrate depressed nearly simple, leaves sub-

quadrate waved subtrifid the segments equal here and there toothed, fruit terminal, cal. obovate. *Hook. Jung. t.* 10.

HAB. Moors, common, growing with *J. resupinata, D. Don.*

24. J. *pusilla*, stem procumbent nearly simple, leaves spreading horizontally quadrate waved obtusely bi-tricrenate, fruit terminal, cal. campanulate, caps. sphærical bursting irregularly. *Hook. Jung. t.* 69.

HAB. Moist, especially clayey, banks.

25. J. *setiformis*, stem erect subsimple, leaves bifarious closely imbricated erect quadrate quadrifid their inferior angles here and there spinuloso-dentate, fruit terminal and lateral, cal. oblong plicate, the mouth open. *Hook. Jung. t.* 20.

HAB. Cairn-gorum, on the summit, *Hook.* Highland mountains, *Dickson.* Clova mountains, *G. Don.*

**** *Leaves two-lobed; the segments unequal, conduplicate.*

26. J. *nemorosa*, stem erect subdichotomous, leaves unequally bilobed semibifid dentato-ciliate, lobes conduplicate, the inferior ones larger obovate, the superior ones subcordate obtuse, fruit terminal, cal. oblong incurved compressed, the mouth truncate dentato-ciliate. *Hook. Jung. t.* 21. *Lightf. p.* 778 (*J. purpurea.*)

HAB. Woods, rocks, and shady places, frequent.

27. J. *umbrosa*, stem nearly erect somewhat branched, leaves unequally bilobed, lobes conduplicate serrated at the extremities acute, the lower ones larger ovate, superior ones roundish-ovate, fruit terminal, cal. oblong incurved compressed, mouth truncated entire. *Hook. Jung. t.* 24.

HAB. On Ben Nevis; in the Den of Rechip, near Dunkeld, *Hook.*

28. J. *undulata*, stem erect subdichotomous, leaves unequally two-lobed waved entire, lobes roundish conduplicate lower ones the largest, fruit terminal, cal. oblong incurved compressed, mouth truncated entire. *Hook. Jung. t.* 22. *Lightf. p.* 776.

HAB. Moist rocks, plentiful; especially by the side of streams.

29. J. *resupinata*, stem procumbent nearly simple, leaves roundish nearly equally bilobed entire, lobes conduplicate, fruit terminal, cal. oblong incurved compressed, mouth truncate toothed. *Hook. Jung. t.* 23. *Lightf. p.* 776.

HAB. Heaths, common, *D. Don.*

30. J. *albicans*, stem erect subdivided, leaves unequally bilobed, lobes conduplicate with a pellucid line in the middle serrated at the extremity, lower ones larger subacinaciform, upper ones oblongo-ovate acute, fruit terminal, cal. obovate cylindrical, the mouth contracted toothed. *Hook. Jung. t.* 25. *Lightf. p.* 777.

HAB. Woods, rocks, heaths, and mountains, abundant.

31. J. *obtusifolia*, stem ascending simple, leaves unequally bilobed,

lobes conduplicate obtuse entire, lower ones larger subacinaciform, superior ones ovate, fruit terminal, cal. obovate, the mouth contracted toothed. *Hook. Jung. t.* 26.

HAB. Cathkin Hills, *Hopk.* Near Newburgh, Fifeshire, *D. Don.*

32. J. *Dicksoni,* stem ascending subsimple, leaves unequally bilobed, lobes conduplicate, lower ones larger, both narrow ovate nearly entire acute, fruit terminal, cal. ovate plicate, the mouth contracted toothed. *Hook. Jung. t.* 48.

HAB. Most abundant upon dry rocks among mosses, near the Falls of the Isla, Angus-shire, *Mr. Lyell.*

33. J. *minuta,* stem erect subdichotomous, leaves horizontally patent subconduplicate, upper ones equally lower ones unequally two-lobed, all the lobes rather acute, fruit terminal cal. obovate a little plicate at the extremity the mouth contracted denticulate. *Hook. Jung. t.* 44.

HAB. Woods and mountains, not rare.

34. J. *cochleariformis,* stem procumbent subsimple, leaves imbricated on the upper side unequally two-lobed conduplicate, superior lobes the larger convex bifid and toothed at the extremity, the lower ones saccate. *Hook. Jung. t.* 68.

HAB. Highland mountains, not uncommon; more plentiful in the N. Highlands, especially in Sutherland.

35. J. *complanata,* stem creeping irregularly branched, leaves distichous imbricated above unequally two-lobed, superior lobes larger orbicular, lower ones ovate appressed plane, fruit terminal, cal. oblong compressed truncated. *Hook. Jung. t.* 81. *Lightf. p.* 780.

HAB. Trunks of trees, common.

†† *Stipulate.*

a. *Leaves entire, or rarely here and there emarginate.*

36. J. *anomala,* stem procumbent simple leaves orbicular and ovato-acuminate, stipules broadly subulate. *Hook. Jung. t.* 34.

HAB. Boggy places in various parts of the Highlands.

37. J. *Taylori,* stem erect subsimple, leaves all rounded, stipules broadly subulate, fruit terminal, cal. ovate compressed at the extremity truncate two-lipped. *Hook. Jung. t.* 57.

HAB. Cairn-gorum, and other mountains in the Highlands, *Hook.* Cathkin Hills, near Glasgow, and on the Ochil Hills, *D. Don.*

38. J. *scalaris,* stem creeping simple, leaves round concave entire and emarginate, stipules broadly subulate, fruit terminal, cal. immersed in the leaves. *Hook. Jung. t.* 61.

HAB. Heaths, banks, &c. abundant.

39. J. *polyanthos,* stem procumbent somewhat branched, leaves horizontal rotundato-quadrate plane entire and emarginate, stipules oblong bifid, fruit upon very short proper branches arising from the lower surface of the stem, cal. much shorter

than the calyptra two-lipped laciniated. *Hook. Jung. t.* 62. *Lightf. p.* 773.

HAB. Bilston Burn, near Edinburgh, and in Angus-shire, *G. Don*; growing in water.

40. J. *viticulosa*, stem procumbent branched, leaves horizontal plane ovate entire, stipules broadly ovate dentato-laciniate, fruit lateral, cal. subterraneous oblong fleshy, the mouth fimbriated with leafy scales. *Hook. Jung. t.* 60. *Lightf. p.* 772.

HAB. Woods and rocks in alpine situations, plentiful.

41. J. *trichomanis*, stem creeping subsimple, leaves horizontal convex ovate entire and emarginate, stipules round lunulari-emarginate, fruit lateral, cal. subterraneous oblong fleshy hairy, the mouth crenate. *Hook. Jung. t.* 79. *Lightf. p.* 769, and *p.* 771 (*J. fissa*).

HAB. Woods, caves in rocks, and shady places, abundant.

b. *Leaves bi- or trifid, the segments equal.*

42. J. *bidentata*, stem procumbent branched, leaves broadly ovate decurrent bifid at the apex, the segments very acute entire, stipules bi-trifid and laciniated, fruit terminal, cal. oblong subtriangular the mouth laciniated. *Hook. Jung. t.* 30. *Lightf. p.* 774.

HAB. Woods and shady places, frequent.

43. J. *stipulacea*, stem procumbent simple, leaves round acutely emarginate at the extremity, segments acute straight, stipules large ovate acuminate with a single tooth at the base on each side, fruit lateral, cal. obovate, subplicate at the extremity the mouth contracted obtusely toothed. *Hook. Jung. t.* 41.

HAB. Scotland, *G. Don*.

44. J. *barbata*, stem procumbent nearly simple, leaves rotundato-quadrate tri-quadrifid, stipules lanceolate acutely bifid their margins laciniated, fruit terminal, cal. ovate contracted and toothed at the mouth. *Hook. Jung. t.* 70. *Lightf. p.* 775 (J. 5-*dentata*).

HAB. Woods and among rocks, plentiful.

45. J. *albescens*, stem creeping branched, leaves very concave nearly hemisphærical emarginate, stipules ovato-lanceolate obtuse, fruit terminal upon short branches, cal. oblongo-ovate toothed at the mouth. *Hook. Jung. t.* 72, and *Suppl. t.* 4.

HAB. Summit of Ben Nevis, on the ground, *Hook.*

46. J. *reptans*, stem creeping branched in a stellated manner, leaves imbricated above subquadrate incurved acutely 4-dentate, stipules broadly quadrate quadridentate, fruit radical, cal. oblong plicate toothed at the mouth. *Hook. Jung. t.* 75. *Lightf. p.* 779.

HAB. Woods, rocks, and on the ground, abundant in shady places.

47. J. *trilobata*, stem creeping flexuose branched bearing flagella, leaves imbricated above ovate convex obtusely tridentate,

stipules broadly subquadrate crenate, fruit arising from the lower part of the stem, cal. oblong subacuminate, the mouth laterally cleft. *Hook. Jung. t.* 86, and *t.* 39 (*J. Doniana*).

HAB. Woods and mountains.

A recent examination of my *J. Doniana* has satisfied me that it is only an injured state of this plant.

c. *Leaves bifid; segments unequal, conduplicate.*

* *Lower or smaller segments plane.*

48. J. *platyphylla*, stem procumbent branched in a pinnated manner, leaves unequally lobed, superior lobes roundish-ovate nearly entire, inferior ones and the stipules ligulate quite entire, fruit lateral, cal. ovate compressed truncate at the mouth inciso-serrate longitudinally cleft on one side. *Hook. Jung. t.* 40, and *Suppl. t.* 3. *Lightf. p.* 784.

HAB. Woods, common.

49. J. *lævigata*, stem procumbent branched in a pinnated manner, leaves unequally two-lobed spinuloso-dentate, superior lobes roundish ovate, inferior ligulate, stipules oblongo-quadrate spinuloso-dentate. *Hook. Jung. t.* 35.

HAB. Woods and rocks in Scotland, not uncommon.

50. J. *ciliaris*, stem procumbent branched in a pinnated manner, leaves very convex unequally two-lobed, lobes and lobules ovate bipartite fringed with long and slender cilia, stipules subquadrate 4- or 5-lobed at the extremity with long cilia, fruit lateral, cal. obovate contracted and toothed at the mouth. *Hook. Jung. t.* 65.

HAB. On the ground in hilly and mountainous situations, abundant.

51. J. *tomentella*, stem nearly erect bipinnate, leaves nearly plane unequally two-lobed cut into numerous capillary segments, superior lobes bipartite, inferior minute, stipules subquadrate laciniate, fruit axillary, cal. oblong cylindrical hairy open at the mouth. *Hook. Jung. t.* 36.

HAB. Moist shady places, not unfrequent. Glen Finlas, near Loch Lomond, *D. Don.*

** *The lower or smaller segments of the leaves involute.*

52. J. *serpyllifolia*, stem creeping loosely branched in a pinnated manner, leaves unequally two-lobed, superior lobes rounded, inferior minute involute, stipules roundish acutely bifid, fruit lateral, cal. broadly obovate pentagonal, the mouth contracted elevated subdentate. *Hook. Jung. t.* 42.

HAB. Not uncommon on trees and rocks.

53. J. *hamatifolia*, stem creeping loosely branched, leaves unequally two-lobed, superior lobes ovate acuminate mostly curved at the extremity, inferior ones involute, stipules ovate acutely bifid, fruit lateral, cal. obovate pentagonal, the mouth contracted elevated and toothed. *Hook. Jung. t.* 51.

Hab. Rocks in the Den of Rechip, near Dunkeld, rare, *Hook.*

*** *Lower or smaller segments of the leaves saccate.*

54. J. *dilatata*, stem creeping irregularly branched, leaves unequally two-lobed, superior lobes ovato-rotundate, inferior rounded saccate, stipules rounded plane emarginate, fruit terminal, cal. obcordate tuberculated triangular. *Hook. Jung. t.* 5.

Hab. Trunks of trees, frequent, and on rocks, *Lightf. p.* 781.

55. J. *Tamarisci*, stem creeping branched in a pinnated manner, leaves unequally two-lobed, superior lobes ovato-roundish, inferior ones minute obovate saccate, stipules subquadrate emarginate the margins revolute, fruit terminal on short branches, cal. obovate smooth triangular. *Hook. Jung. t.* 6. *Lightf. p.* 782.

Hab. Common on rocks and heaths.

B. *Frondose.*

a. *Nerveless.*

56. J. *pinguis*, frond oblong decumbent nerveless fleshy nearly plane above swelling beneath irregularly branched, the margin sinuated, fruit arising from the underside near the margin, cal. very short the mouth dilated fimbriated, calyptra exserted oblongo-cylindrical, smooth. *Hook. Jung. t.* 46. *Lightf. p.* 789.

Hab. Wet and boggy places, Pentland Hills, *Mr. Greville.*

57. J. *multifida*, frond linear nerveless fleshy compressed branched in a pinnated manner, fruit marginal, cal. very short, the mouth dilated fimbriated, calyptra exserted oblongo-cylindrical tuberculated. *Hook. Jung. t.* 45.

Hab. Bogs, common.

b. *Fronds with a nerve.*

* *Cal. single.*

58. J. *Blasia*, frond oblong submembranaceous dichotomous costate having scattered scales on the underside, cal. and the calyptra within the frond. *Hook. Jung. t.* 72, 73, and 74. *Blasia pusilla*, *Lightf. p.* 1118.

Hab. Woods and exposed rocky or heathy places. In fruit, at Kinnordy, *Mr. Lyell;* and Auchindenny wood, *Mr. Greville.*

59. J. *epiphylla*, frond oblong submembranaceous irregularly divided obsoletely ribbed the margin entire or lobed and sinuated, fruit arising from the superior part of the frond near the apex, cal. subcylindrical plicate, the mouth dilated inciso-dentate, calyptra exserted smooth. *Hook. Jung. t.* 47. *Lightf. p.* 788.

Hab. Shady moist places in bogs, plentiful.

60. J. *furcata*, frond linear dichotomous membranaceous costate glabrous above more or less hairy beneath and on the margin, fruit arising from the lower surface of the nerve, cal. 2-lobed

conduplicate ciliated at the margin, calyptra obovate hispid. *Hook. Jung. t.* 55 and 56. *Lightf. p.* 791.

HAB. Trunks of trees and rocks, plentiful.

61. J. *pubescens*, frond linear dichotomous membranaceous costate pubescent in every part. *Hook. Jung. t.* 73.

HAB. Rocks in alpine situations, not uncommon.

** *Calyx double.*

62. J. *Lyellii*, frond oblong somewhat branched membranous costate the margin nearly entire, fruit arising from the superior surface of the fronds, cal. double, ext. very short its margin laciniato-dentate, int. much exserted cylindrical subplicate, calyptra longer than the cal. *Hook. Jung. t.* 77.

HAB. Drumly Airy, a waterfall on the Noran, Angus-shire, *Mr. Lyell.* Damp woods, near the burn side, Forfar, *D. Don.*

63. J. *hibernica*, frond oblong dichotomous membranous costate with the margin entire, fruit arising from the superior surface of the frond, cal. double, ext. very short laciniated, int. much exserted ovato-cylindrical subplicate, calyptra much shorter than the interior cal. *Hook. Jung. t.* 78, and *Suppl. t.* 4.

HAB. Catlaw, near Kinnordy, Angus-shire, *Mr. Lyell.*

4. TARGIONIA.

Common receptacle of the fruit none. *Perianth* or *calyx* globose, arising from the underside of the extremity of the frond, at length opening vertically into 2 valves. *Capsule* globose, nearly sessile, included in the cal., opening irregularly at the extremity and filled with *seeds* and *spiral filaments.*

1. T. *hypophylla. Lightf. p.* 792. *E. B.*

HAB. Moist banks, rare. Near the Tarbet of Cantire, on the confines of Knapdale, *Lightf.*

Fronds imbricated, dark green, oblongo-obovate, purple and scaly beneath, with many radicles. *Cal.* sphærical, sessile. No bodies analogous to *anthers* (as they are called) have ever been discovered on this plant, nor any kind of fructification but the capsular.

5. MARCHANTIA.

Common receptacle of the *fruit* pedunculated peltate, bearing beneath shortly pedunculated capsules which are pendent, opening at the extremity with about 8 teeth, and filled with *seeds* and *spiral filaments. Anthers* (?) oblong, sessile, imbedded in a flat carnose sessile or pedunculated papillary disk. —*Gemmæ* are also abundant in this genus on the frond, lenticular, contained in variously shaped receptacles, and germinating even while on the parent frond.

1. M. *polymorpha*, receptacle of the capsules deeply cut in a stellated manner into about ten narrow segments, that of the anthers pedunculated. *Lightf. p.* 793. *E. B. t.* 210.

Hab. On shady moist rocks, on the banks of rivulets and the sides of wells and sometimes bogs, *Lightf.*

Cups of gemmæ serrated at the margin.

2. M. *hemisphærica*, receptacle of the capsules hemisphærical cloven into about 5 oval segments. *E. B. t.* 503. *Lightf. p.* 796.

Hab. Wet rocks and banks, by the sides of rivulets amongst the mountains, not uncommon, *Lightf.*

3. M. *androgyna*, "receptacle of the capsules hemisphærical half four-cleft of four cells," *Sm. E. B. t.* 2545.

Hab. Wet rocks in Scotland, *Dickson, Dr. Stuart*, and *Sir J. E. Smith.*

4. M. *conica*, receptacle of the capsules entire conical ovate somewhat angular, that of the anthers sessile. *Lightf. p.* 797. *E. B. t.* 504.

Hab. Moist shady banks by the sides of rivulets.

Order VI. MUSCI.

Fructification of two kinds. *Capsules*, in an early stage, covered with a calyptra, tipped with a style, which bursts transversely and regularly and rises up with the mostly pedunculated and operculated *capsule*. *Operculum* or *lid* deciduous in most instances; *mouth* of the *capsule* furnished with a single or double *fringe*; containing *seeds* surrounding a columella, destitute of spiral filaments:—and sphærical pedicellated reticulated *bodies*, concealed for the most part in peculiarly shaped leaves, and which have been considered *anthers*.

Plants of small size, of a more or less compactly cellular structure, readily reviving by the application of moisture after being dry, bearing leaves which are very rarely indeed divided, often nerved, entire or toothed, or serrated at the margin.

A. *Peristome none.*

1. ANDRÆA.

Capsule 4-valved, the *valves* cohering at the extremity by means of the persistent *lid*. *Calyptra* irregularly torn. *Musc. Brit.*[*] *t.* 1.

* *Leaves destitute of a nerve.*

1. A. *alpina*, stems branched, leaves obovate suddenly acuminated straight imbricating the stem on every side. *Musc. Brit. p.* 1. *t.* 8. *Jungermannia alpina*, *Lightf. p.* 787.

Hab. Alpine rocks, not very common.

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[*] Throughout this Order the arrangement, &c., adopted in "*Hooker* and *Taylor's Muscologia Britannica*," are followed.

2. A. *rupestris*, stems branched, leaves ovate gradually acuminated, the upper ones falcate. *Musc. Brit. p.* 2. *t.* 8. *Jungermannia rupestris*, *Lightf. p.* 787.

Hab. Rocky mountains, not unfrequent.

** *Leaves furnished with a nerve.*

3. A. *Rothii*, stems almost simple, leaves lanceolato-subulate falcato-secund fragile, perichætial ones oblong nerveless their margins involute. *Musc. Brit. p.* 2. *t.* 8.

Hab. Alpine rocks, not rare.

4. A. *nivalis*, stems slightly branched, leaves loosely imbricated lanceolate subfalcate secund, perichætial ones similar to the cauline ones. *Musc. Brit. p.* 2. *t.* 8.

Hab. Rocks upon the highest summit of Ben Nevis, on the eastern side, *Hook.*

2. SPHAGNUM.

Receptacle pedunculated, its peduncle resembling a fruitstalk. *Capsule* sessile, entire, its *lid* deciduous, its *mouth* naked. *Calyptra* irregularly torn. *Musc. Brit. t.* 1.

1. S. *obtusifolium*, branches tumid, leaves ovate obtuse. *Musc. Brit. p.* 3. *t.* 4.

Hab. Bogs, common.

2. S. *squarrosum*, branches attenuated at their extremities, leaves ovato-acuminated squarrose recurved. *Musc. Brit. p.* 4. *t.* 4.

Hab. Arlary, *Mr. Arnott*, in fr. Ravelrig-toll, and near N. Queensferry, *Mr. Greville.* Marshes, near Glasgow, *D. Don.*

3. S. *acutifolium*, branches attenuated, leaves ovato-lanceolate crowded. *Musc. Brit. p.* 4. *t.* 4.

Hab. Bogs, plentiful.

4. S. *cuspidatum*, branches attenuated, leaves lanceolato-subulate lax *Musc. Brit. p.* 4. *t.* 4.

Hab. Growing in the water in boggy places.

3. PHASCUM.

Fruitstalks terminal. *Lid* persistent. *Calyptra* dimidiate. *Musc. Brit. t.* 1.

* *Shoots creeping; leafless, articulated, branched.*

1. Ph. *serratum*, shoots branched conferva-like, perichætial leaves lanceolate serrated nerveless. *Musc. Brit. p.* 5. *t.* 5.

Hab. Wall top, opposite Blair Adam, Kinross-shire, *Mr. Arnott.* Pastures, Angus-shire, and marshes on Braid hills, *G. Don.*

** *Creeping shoots none.*

† *Leaves more or less subulate.*

2. Ph. *crispum*, leaves lanceolato-subulate flexuose crisped when dry. *Hook. & Tayl. Musc. Brit. p.* 6. *t.* 5.

Hab. Scotland, *G. Don.* Caroline park, on the ground, *Mr. Arnott.*

3. Ph. *subulatum*, leaves subulato-setaceous straight their nerve

disappearing below the point. *Hook. & Tayl. Musc. Brit. p.* 6. *t.* 5. *Lightf. p.* 694.

HAB. Dry banks.

4. Ph. *axillare*, leaves lanceolato-subulate straight their nerve disappearing below the point, fruit at length lateral. *Musc. Brit. p.* 7. *t.* 5.

HAB. Banks, Angus-shire, *G. Don.*

†† *Leaves more or less ovate.*

(*Fruitstalk entirely immersed among the leaves.*)

5. Ph. *muticum*, leaves ovato-rotundate acuminate concave connivent, the nerve reaching to the point. *Musc. Brit. p.* 7. *t.* 5.

HAB. Banks, not uncommon.

6. Ph. *cuspidatum*, leaves ovato-acuminate erect their nerve reaching to the point. *Musc. Brit. p.* 8. *t.* 5. *Phascum acaulon, Lightf. p.* 693.

β. *piliferum*, leaves hair-pointed.

HAB. Sandy fields, common. β. King's Park, Edinb., *G. Don.* Arthur's Seat, common, *Mr. Greville.*

4. GYMNOSTOMUM.

Fruitstalks terminal. *Mouth* of the *capsule* naked. *Calyptra* dimidiate. *Musc. Brit. t.* 1.

* *Stem elongated, branched.*

1. G. *lapponicum*, leaves linear-lanceolate crisped when dry, the parichætial ones broadly ovate their margins involute, capsule turbinate striated. *Musc. Brit. p.* 10. *t.* 6.

HAB. Summits of Clova, *G. Don.* Mountains E. of Ben Voirlich, *Mr. Arnott.*

2. G. *æstivum*, leaves lanceolate twisted when dry, the perichætial ones broadly ovate their margins involute, capsule oblong smooth. *Musc. Brit. p.* 10. *t.* 6.

HAB. Wet rocks, not uncommon.

3. G. *viridissimum*, leaves broadly lanceolate, capsule ovate, lid obliquely rostrate. *Musc. Brit. p.* 10. *t.* 6.

HAB. Inch Keith, *D. Don.*

4. G. *curvirostrum*, leaves subulate, capsule turbinate ovate, lid obliquely rostrate. *Musc. Brit. p.* 11. *t.* 6.

HAB. Moist rocks, not rare.

** *Stems short, simple.*

5. G. *ovatum*, leaves ovate erect concave piliferous their nerve furnished with a granuliferous membrane, lid rostrate. *Musc. Brit. p.* 11. *t.* 7.

HAB. Banks and walls. Dumbarton and Angus-shire, *D. Don.* Very common, *Mr. Greville.*

6. G. *truncatulum*, leaves ovate apiculate patent nearly plane,

lid obliquely rostrate. *Musc. Brit. p.* 12. *t.* 7. *Bryum truncatulum, Lightf. p.* 730.

Hab. Corn-fields and banks, common.

7. G. *Heimii,* leaves lanceolate serrated at the point, capsule ovato-oblong, lid obliquely rostrate. *Musc. Brit. t.* 12. *f.* 7.

Hab. Banks, especially near the sea.

8. G. *fasciculare,* leaves oblongo-acuminate nearly plane subserrated marginated, capsule pyriform, lid plane sub-mammillate. *Musc. Brit. p.* 12. *t.* 8.

Hab. Moors, near Forfar, plentiful, *D. Don.* Lismore, *Capt. Carmichael.* Cleish hills, *Mr. Arnott.*

9. G. *pyriforme,* leaves ovato-acuminate concave serrated not marginated, capsule roundish obovate, lid convex shortly rostrate. *Musc. Brit. p.* 13. *t.* 7. *Bryum pyriforme, Lightf. p.* 718.

Hab. Ditches, banks, &c., common.

10. G. *tenue,* stem scarcely any, outer leaves very short ovato-lanceolate, inner ones lineari-lanceolate, all of them erect obtuse with a strong nerve disappearing below the summit, capsule oblong. *Musc. Brit. p.* 13. *t.* 7.

Hab. Buchanan Castle; on sandstone rocks above Blantyre Priory, near Glasgow, *D. Don.* Auchindenny Woods, near Pennycuik, and Den of Dupplin, *Mr. Arnott.*

11. G. *Donianum,* stem very short, leaves subulate straight, capsule turbinate. *Musc. Brit. p.* 13. *t.* 7.

Hab. Sandstone rocks in the Den of Dupplin, *G. Don.*

12. G. *microstomum,* leaves broadly subulate, their margin involute above flexuose crisped when dry, capsule elliptical contracted at the mouth, lid subulate incurved. *Musc. Brit. p.* 13. *t.* 7.

Hab. Clova mountains, also Ben High and Ben Nevis, *D. Don.* Glen Targ, Perthshire? *Mr. Arnott.*

5. ANICTANGIUM.

Fruitstalks terminal. Mouth of the *capsule* naked. *Calyptra* mitriform. *Musc. Brit. p.* 14. *t.* 1.

1. A. *ciliatum,* leaves ovate much lengthened out and diaphanous at the points, those of the perichætium laciniated at their extremity. *Musc. Brit. p.* 14. *t.* 6.

Hab. Rocks, especially in subalpine places.

B. *Mouth of the capsule having a peristome.*

a. *Peristome single.*

6. DIPHYSCIUM.

Fruitstalk terminal. *Capsule* gibbous. *Peristome* single, forming a plicated, membranous, truncated cone. *Calyptra* mitriform. *Musc. Brit. p.* 15. *t.* 1.

1. D. *foliosum, Hook. & Tayl. Musc. Brit. p.* 16 *t.* VIII. *Buxbaumia foliosa, E. B. t.* 329. *Phascum maximum, Lightf. p.* 693.

Hab. Among rocks in alpine situations. Lorn, *Capt. Carmichael.*

Growing in dense patches. *Stems* short, scarcely any. *Leaves* minute, ligulate, with a strong nerve. Those of the *perichætium* large, erect, membranous, nerved, lacerated, concealing the large oblique almost sessile *capsule.*

7. TETRAPHIS.

Fruitstalk terminal. *Peristome* single, consisting of four equidistant upright teeth. *Calyptra* mitriform. *Musc. Brit. p.* 16. *t.* 1.

1. T. *pellucida*, stems elongated, leaves ovato-acuminate those of the perichætium lanceolate, capsule cylindrical. *Musc. Brit. p.* 16. *t.* 8. *Bryum pellucidum, Lightf. p.* 724.

Hab. On the ground, trunks of trees, posts, rails, &c. especially in woods.

2. T. *ovata*, stems very short, leaves few linear slightly incrassated upwards those of the perichætium ovate obtuse, capsule ovate. *Musc. Brit. p.* 17. *t.* 8.

Hab. On sandstone rocks by the side of the Black Devon, a small river in Fifeshire, *Maugh.* Arniston woods, Edinburgh; Kirkcaldy Den, and under a waterfall at Killside, Fifeshire, *Mr. Arnott.* Fall of the Aray, *Mr. Borrer.* Auchindenny woods, abundant, *Mr. Greville.*

8. SPLACHNUM.

Fruitstalks terminal. *Peristome* single, of eight double teeth. *Capsule* with an evident apophysis. *Calyptra* mitriform, without furrows. *Musc. Brit. p.* 18. *t.* 1.

* *Leaves acuminate.*

1. S. *sphæricum*, leaves ovato-rotundate acuminate slightly serrated, apophysis ovato-globose wider than the capsule. *Musc. Brit. p.* 18. *t.* 9. *Splachnum vasculosum, Lightf. p.* 697.

Hab. Dung of various animals, especially in mountainous situations.

2. S. *tenue*, leaves ovato-acuminate serrated, apophysis obconical narrower than the capsule, columella exserted. *Musc. Brit. p.* 19. *t.* 9.

Hab. On the ground in the Highland mountains; never on dung.

3. S. *mnioides*, leaves ovato-lanceolate much acuminated concave entire, apophysis obovate nearly as narrow as the capsule. *Musc. Brit. p.* 20. *t.* 9.

α. *minus*, of a deeper colour with shorter stems. *S. mnioides, Hedw.*

β. *majus*, of a paler colour with elongated stems. *S. fastigiatum, Dicks.*

Hab. On the ground in the Highland mountains, not uncommon. Ben Lawers, abundant.

4. S. *angustatum*, leaves ovato-lanceolate much acuminated serrated, apophysis obovate somewhat narrower than the cap-

sule, fruitstalks scarcely longer than the leaves. *Musc. Brit. p.* 20. *t.* 9.

HAB. Cow-dung by Loch Awen, *Dickson.* Scotch mountains, *Mr. Mackay.* Cairn-gorum, on the turfy soil, *Hook.* Clova mountains, *G. Don.*

5. S. ***ampullaceum***, leaves ovato-lanceolate acuminate serrated, apophysis inversely flagon-shaped twice as wide as the capsule. *Musc. Brit. p.* 20. *t.* 9. *Lightf. p.* 696.

HAB. Bogs and dung of animals, on the plains as well as in the mountains.

** *Leaves obtuse.*

6. S. ***vasculosum***, leaves rhombo-rotundate obtuse the nerve disappearing below the point, apophysis globose much wider than the capsule. *Musc. Brit: p.* 21. *Suppl. t.* 1.

HAB. Scotland, *G. Don.* Bog half-way up Ben Lawers, *Mr. J. T. Mackay.*

7. ***Frœlichianum***, leaves ovate rounded at the points their nerve disappearing before the summit, apophysis obovate much narrower than the capsule. *Hook. & Tayl. Musc. Brit. p.* 21. *t.* 9.

HAB. On Ben High, *Dickson.*

9. CONOSTOMUM.

Fruitstalks terminal. *Peristome* single, of 16 equidistant teeth all united at their summits. *Calyptra* dimidiate. *Musc. Brit. p.* 22. *t.* 10.

1. C. ***boreale***, stems rather short, leaves lanceolate acuminated carinated slightly toothed. *Hook. & Tayl. Musc. Brit. p.* 22. *t.* 10.

HAB. Summits of the Highland mountains. Very fine upon Ben Lomond.

10. POLYTRICHUM.

Fruitstalks terminal. *Peristome* single, of 32 or 64 equidistant incurved teeth, their summits united by a horizontal membrane. *Calyptra* dimidiate, small. *Musc. Brit. p.* 23. *t.* 1.

* *Calyptra naked.*

1. P. ***undulatum***, leaves lanceolate undulate their margins plane denticulated their nerve winged, capsule cylindrical curved, lid subulate. *Musc. Brit. p.* 23. *t.* 10. *Bryum undulatum, Lightf. p.* 722.

HAB. Moist shady banks, and in woods.

2. P. ***hercynicum***, leaves lanceolate rigid entire their sides involute, their nerve broad impressed with furrows, capsule oblong suberect, lid conical. *Musc. Brit. p.* 24. *t.* 10.

HAB. Mountains. Ben Lomond, near the summit, plentiful.

** *Calyptra covered with succulent filaments.*

† *Leaves entire, their margins involute.*

3. P. ***piliferum***, leaves lanceolato-subulate their margins involute

entire terminating in a pellucid hair-like point, capsule ovate obtusely quadrangular furnished with an apophysis, lid conical. *Musc. Brit. p.* 24. *t.* 10.

HAB. Heaths.

4. P. *juniperinum*, leaves lanceolato-subulate their margins involute entire their points acuminated coloured subserrated, capsule ovate obtusely quadrangular furnished with an apophysis, lid conical. *Musc. Brit. p.* 25. *t.* 10.

HAB. Heathy places.

5. P. *septentrionale*, leaves lineari-subulate obtuse their margins especially towards the top involute subserrulate, capsule ovate subangulate furnished with a minute apophysis, lid conical acuminate. *Musc. Brit. p.* 25. *t.* 10.

HAB. Highest summit of Ben Nevis. On Ben Lomond, rare.

†† *Leaves serrated, their margins plane.*

6. P. *commune*, stems elongated, leaves patent lineari-subulate their margins plane serrated as well as the points of the keels, capsule erect ovate quadrangular with an evident apophysis. *Musc. Brit. p.* 26. *t.* 10. *Lightf. p.* 698.

HAB. Heaths, in dry and wet places, varying much in size according to its place of growth.

7. P. *alpinum*, stems elongated branched, leaves patent subulato-lanceolate the margins plane serrated as well as the points of the keels, capsule sub-ovate with an indistinct apophysis. *Musc. Brit. p.* 27. *t.* 11. *Lightf. p.* 703.

HAB. Mountains, in rather elevated situations.

8. P. *urnigerum*, stems elongated branched, leaves erect patent lanceolate acute their margins plane serrated, capsule erect cylindrical destitute of an apophysis. *Musc. Brit. p.* 27. *t.* 11. *Lightf. p.* 703.

HAB. Hilly places. In the Highlands, frequent.

9. P. *alcides*, stems short, leaves linear-lanceolate obtuse their margins plane serrated principally at the extremity and at the summit of the keels, capsule nearly erect cylindrical without an apophysis. *Musc. Brit: p.* 28. *t.* 11.

HAB. Moist shady banks, abundant.

10. P. *nanum*, stems short, leaves linear-lanceolate obtuse their margins serrated principally at the extremity as well as the summit of the keels, capsule nearly erect subglobose. *Musc. Brit. p.* 28. *t.* 11. *Lightf. p.* 701.

HAB. Moist banks, often with *P. aloides*, from which it is only distinguishable by the rounder *capsules*.

11. CINCLIDOTUS.

Fruitstalks terminal. *Peristome* single, of 32 filiform, twisted teeth, anastomosing at their base. *Calyptra* mitriform. *Musc. Brit. p.* 29. *t.* 1.

1. C. *fontinaloides.* *Musc. Brit. p.* 29. *t.* 11. *Fontinalis minor, Lightf. p.* 695.

HAB. On stones and wood in water. Collington, *G. Don.* Border of Lochnell, *Capt. Carmichael.*

Four to six inches long, dark green. *Leaves* elliptico-lanceolate, acuminate, margined, entire, flexuose, curled when dry, nerve stout. *Fruitstalks* shorter than the oblong *capsule.*

12. TORTULA.

Fruitstalks terminal. *Peristome* single, of 32 filiform, twisted teeth, more or less united at the base by a tubiform *membrane. Calyptra* dimidiate. *Hook. & Tayl. Musc. Brit. p.* 30. *t.* 2.

1. T. *muralis,* stems short, leaves patent lineari-oblong their margins recurved, nerve produced beyond the leaf into a white hair-like point, capsule oblong, lid conical acuminate. *Musc. Brit. p.* 30. *t.* 11. *Bryum murale, Lightf. p.* 720.

HAB. On walls and stones.

2. T. *ruralis,* stems elongated, leaves oblong carinated patent and recurved, nerve terminating in a long generally diaphanous serrated point, capsule oblong, lid subulate, teeth of the peristome united below into a tube. *Musc. Brit. p.* 30. *t.* 12. *Bryum rurale, Lightf. p.* 720.

HAB. Roofs of houses, on trees and banks.

3. T. *subulata,* stems very short, leaves oblongo-lanceolate acuminate the nerve excurrent often forming an apiculus, capsule cylindrical, lid conico-subulate, teeth of the peristome united nearly to the apex into a long tube. *Musc. Brit. p.* 31. *t.* 12.. *Bryum subulatum, Lightf. p.* 719.

HAB. Banks, common.

4. T. *stellata,* stems scarcely any, leaves ovate concave, nerve running beyond the points, capsule ovate striated, lid rostrate. *Musc. Brit. p.* 32. *t.* 12.

HAB. Scotland, *Dickson.*

5. T. *tortuosa,* stems elongated branched, leaves lineari-subulate carinate undulate much twisted when dry, capsule cylindrical, lid rostrate. *Musc. Brit. p.* 32. *t.* 12. *Bryum tortuosum, Lightf. p.* 727.

HAB. Rocky places. Pentland hills, *Mr. Greville.* Angus-shire, *G. Don.*

6. T. *fallax,* stems elongated branched, leaves lanceolato-subulate patent or recurved their margins reflexed, capsule oblong, lid rostrate nearly as long as the capsule. *Musc. Brit. p.* 32. *t.* 12.

HAB. Walls, banks, and in fields among grass.

7. T. *revoluta,* stems short, leaves lanceolate acuminate the margins of those of the stem remarkably revolute, perichætial

leaves sheathing, their sides involute, capsule oblong, lid rostrate shorter than the capsule. *Musc. Brit. p.* 33. *t.* 12.

Hab. Banks and wall-tops.

8. T. *unguiculata*, stems branched, leaves linear-lanceolate obtuse their nerve produced into an apiculus, the margins nearly plane, capsule oblong, lid rostrate nearly as long as the capsule. *Musc. Brit. p.* 33. *t.* 12.

Hab. Banks and hedges.

9. T. *convoluta*, stems short, leaves oblong rather obtuse, nerve not produced beyond the point the margins plane or slightly incurved, perichætial leaves sheathing acute remarkably convolute, capsule oblong, lid rostrate. *Musc. Brit. p.* 34. *t.* 12.

Hab. Moist banks. Pastures near Clyde Iron-works, *D. Don.*

13. ENCALYPTA.

Fruitstalks terminal. *Peristome* single, of 16 teeth. *Calyptra* campanulate, smooth, entirely inclosing the mature capsule. *Musc. Brit. p.* 34. *t.* 2.

1. E. *streptocarpa*, stems elongated, leaves elliptico-lanceolate somewhat obtuse their nerve not produced beyond the summits, capsule cylindrical spirally striated, calyptra toothed at the base. *Musc. Brit. p.* 34. *t.* 13.

Hab. Stony mountainous countries. Arthur's Seat and Pentland hills, but without fr., *Mr. Arnott.* Woods at Dunkeld, in the Duke of Athol's grounds, in a fine state of *fructification.*

2. E. *ciliata*, stems short, leaves oblong acuminate, nerve more or less produced beyond the summit, capsule cylindrical, calyptra toothed at the base. *Musc. Brit. p.* 35. *t.* 13.

α. *concolor*, leaves mostly apiculate, their points of the same colour, capsule smooth. *E. ciliata of authors.*

β. *alpina*, leaves much acuminated, their points diaphanous, capsules smooth. *E. alpina, E. B.*

Hab. Elevated mountains, α. and β. not rare. Pentland hills, abundant, *Mr. Greville.*

3. E. *vulgaris*, stems short, leaves oblongo-elliptical obtuse their nerve produced a little beyond the summits, capsule cylindrical smooth, calyptra entire at the base. *Musc. Brit. p.* 35. *t.* 13. *Bryum extinctorium, Lightf. p.* 718.

Hab. Banks, walls, and rocks. Walls about Edinb., frequent, *Mr. Greville.* Fissures of rocks, Lorn, *Capt. Carmichael.*

14. GRIMMIA.

Fruitstalks terminal. *Peristome* of 16 entire, or perforated, rarely cleft, equidistant teeth. *Calyptra* mitriform. *Musc. Brit. p.* 36. *t.* 2.

* *Fruitstalks scarcely any.*

1. Gr. *apocarpa*, stems branched, leaves ovato-lanceolate re-

curvo-patent their margins reflexed, the perichætial ones having their nerve disappearing immediately below their summits, capsule ovate sessile, lid shortly rostrate. *Musc. Brit. p.* 36. *t.* 10.

α. *nigro-viridis*, leaves broader blackish green. *Gr. apocarpa of authors. Bryum apoc., Lightf. p.* 716.

β. *stricta*, stem elongated, leaves narrower reddish. *Gr. stricta, Turn.*

HAB. Trees and rocks, common. β. Alpine rocks.

2. Gr. *maritima*, stems short pulvinate, leaves lanceolate acuminate nearly erect crisped when dry their margins recurved, the perichætial ones with their nerve running beyond the summits, capsule ovate sessile, lid shortly rostrate. *Musc. Brit. p.* 37. *t.* 10.

HAB. Rocks by the sea-shore. Most abundant in Lorn and Appin, *Capt. Carmichael.*

** *Fruitstalks longer than the leaves.*

† *Fruitstalks curved.*

3. Gr. *pulvinata*, stems short pulvinate, leaves narrow-elliptical their margins recurved their points diaphanous filiform, capsule ovate striated, fruitstalks curved, lid conical acuminate. *Musc. Brit. p.* 38. *t.* 13. *Bryum pulvinatum, Lightf. p.* 735.

HAB. Walls and rocks.

†† *Fruitstalks straight.*

4. Gr. *ovata*, stems slightly branched, leaves lanceolato-subulate gradually produced into long diaphanous hair-like points their margins incurved, capsule ovate, teeth of the peristome often perforated and split, lid rostrate. *Musc. Brit. p.* 39. *t.* 13.

HAB. Alpine rocks.

5. Gr. *Doniana*, stems short, leaves lanceolato-subulate produced into long diaphanous hair-like points their margins incurved, capsule ovate, teeth of the peristome quite entire, lid shortly rostrate. *Musc. Brit. p.* 40. *t.* 10.

HAB. Rocks in mountainous districts.

15. PTEROGONIUM.

Fruitstalks lateral. *Peristome* single, of 16 entire equidistant teeth. *Calyptra* dimidiate. *Musc. Brit. p.* 40. *t.* 2.

1. Pt. *gracile*, branches fascicled curved, leaves broadly ovate acute concave, their margins plane, summits serrated faintly two-nerved at the base, lid conical. *Musc. Brit. p.* 41. *t.* 14. *Hypnum gracile, Lightf. p.* 766.

HAB. Rocks in subalpine situations, not uncommon.

2. Pt. *filiforme*, stems irregularly branched curved, leaves ovate subacuminated concave their margins recurved serrated, nerve single or forked short faint, lid conical. *Musc. Brit. p.* 41. *t.* 14.

Hab. Mountains. Trunks of trees on the ascent of Cairn Gorum. Rocks, *D. Don.* Lowlands, *Mr. Mackay.*

16. WEISSIA.

Fruitstalks terminal. *Peristome* single of 16 entire equidistant teeth. *Calyptra* dimidiate. *Musc. Brit. p.* 42. *t.* 2.

* *Capsule with an apophysis.*

1. W. *splachnoides*, leaves lingulate rounded at the top their nerve disappearing below the summit, capsule obovate, apophysis obconical, lid convex acuminulate. *Musc. Brit. p.* 42. *t.* 14.

Hab. Turf bogs on the Scotch Alps, *Dicks.* Ben Lawers, *G. Don.* Sparingly on Ben Lomond, *D. Don.*

2. W. *Templetoni*, leaves ovato-lanceolate acute, capsule (with the apophysis) narrowly pyriform, lid nearly plane. *Musc. Brit. p.* 42. *t.* 14.

Hab. Oozy, shaded rocks, in Lorn and Appin, *Capt. Carmichael.*

** *Capsule destitute of an apophysis.*

† *Leaves nerveless.*

3. W. *nuda*, stems scarcely any, leaves ovato-lanceolate nerveless, capsule ovate gibbous on one side cernuous. *Musc. Brit. p.* 43. *t.* 14.

Hab. Clayey places; banks of the Tay, near Perth, *G. Don.*

†† *Leaves furnished with a nerve.*

+ *Leaves ovate or lanceolate.*

4. W. *nigrita*, stems elongated, leaves lanceolate acuminated, capsule obovate cernuous gibbous sulcate, lid hemisphærical obtusely pointed. *Musc. Brit. p.* 43. *t.* 14.

Hab. Moist banks. In the Highland mountains, frequent, *G.* and *D. Don.*

5. W. *lanceolata*, stems somewhat elongated, leaves ovate with an excurrent nerve almost piliferous, capsule ovate, lid obliquely rostrate. *Musc. Brit. p.* 44. *t.* 14.

Hab. Wall-top at Kirkliston, *Mr. Arnott.*

++ *Leaves linear or subulate.*

6. W. *striata*, leaves linear denticulate crisped when dry capsule ovato-turbinate sulcate erect, lid obliquely subulate. *Musc. Brit. p.* 45. *t.* 15.

Hab. Ben Voirlich, *Mr. Arnott.* Moist fissures of rocks in Lorn, *Capt. Carmichael.* Mountains of Angus-shire, &c., *G. Don.*

7. W. *cirrata*, leaves broadly subulate crisped when dry, their margins recurved, capsule ovate, lid rostrate. *Musc. Brit. p.* 46. *t.* 15. *Bryum cirratum, Lightf. p.* 728.

Hab. Posts, rails, rocks, and even trees.

8. W. *curvirostra*, leaves linear-subulate, capsule ovato-cylindraceous, lid rostrate. *Musc. Brit. p.* 46. *t.* 15.

Hab. Among rocks and on banks. Angus-shire, *G. Don.* Appin, *Capt. Carmichael.* King's Park, Edinb., &c., *Mr. Arnott.*

9. W. *crispula*, stems divided, leaves from a broad base lanceolato-subulate crisped when dry their margins incurved, capsule ovato-elliptical, lid rostrate. *Musc. Brit. p.* 46. *t.* 15.

Hab. Rocks. Pentland hills, &c., *Mr. Arnott.*

10. W. *controversa*, stems nearly simple, leaves lineari-subulate crisped when dry their margins incurved, capsule ovato-elliptical, lid rostrate. *Musc. Brit. p.* 47. *t.* 15. *Bryum viridulum, Lightf. p.* 731.

Hab. Banks, common.

11. W. *recurvata*, stems scarcely any, leaves subulate, capsule broadly ovate, fruitstalks curved, lid rostrate. *Musc. Brit. p.* 47. *t.* 15.

Hab. Rocks. Habbie's How, Pentlands; Cliesh hills, &c., *Mr. Arnott.* On sandstone, banks of the Esk and Isla; Bilston burn, *G. Don.* Above Blantyre priory, *D. Don.*

12. W. *acuta*, stems branched, leaves subulato-setaceous subsecund rigid canaliculate, capsule turbinate, lid rostrate. *Musc. Brit. p.* 48. *t.* 15.

Hab. Rocks in alpine situations.

17. DICRANUM.

Fruitstalks terminal (except in *D. adiantoides* and *D. taxifolium*). *Peristome* single, of 16 bifid equidistant teeth. *Calyptra* dimidiate. *Musc. Brit. p.* 48. *t.* 2.

A. *Leaves inserted in a bifarious manner.* (*Fissidens, Hedw.*)

1. D. *bryoides*, fruitstalks terminal, perichætial leaves resembling the cauline ones. *Musc. Brit. p.* 49. *t.* 16. *Hypnum bryoides, Lightf. p.* 739.

Hab. Moist banks, common.

2. D. *adiantoides*, fruitstalks lateral, perichætial leaves ovate slightly convolute pointed. *Musc. Brit. p.* 51. *t.* 16.

Hab. Mossy grounds and wet banks.

3. D. *taxifolium*, fruitstalks radical, perichætial leaves ovate sheathing involute pointed. *Musc. Brit. p.* 51. *t.* 16. *Hypnum taxif., Lightf. p.* 740.

Hab. Moist banks.

B. *Leaves inserted on all sides of the stem.*

a. *Leaves destitute of a nerve.*

4. D. *glaucum*, stems branched fastigiate, leaves erecto-patent ovato-lanceolate straight nerveless entire, capsule ovate cernuous, lid rostrate. *Musc. Brit. p.* 52. *t.* 16. *Bryum glaucum, Lightf. p.* 723.

Hab. Pentland hills, *Mr. Arnott.* Lorn, *Capt. Carmichael.* Alpine moors, common, *D. Don.*

b. *Leaves furnished with a nerve.*

* *Leaves apiculate or piliferous.*

5. D. *latifolium*, stems short, leaves oblong concave entire apiculate or piliferous, capsule erect ovato-oblong, lid rostrate. *Musc. Brit. p.* 52. *t.* 16.

HAB. Shady banks, near Aberfeldy, *Dickson.*

** *Leaves not apiculate.*

† *Nerve very broad.*

6. D. *cerviculatum*, stems short, leaves lanceolato-subulate entire subsecund their nerve very broad, capsule ovate subcernuous strumose, lid rostrate. *Musc. Brit. p.* 53. *t.* 16.

HAB. Near St. David's, Fifeshire, also in Restenat moss, *Mr. Arnott.* Clayey banks, Daldowie, *D. Don.*

7. D. *flexuosum*, stems nearly simple rigid, leaves lanceolato-subulate acuminated straight their nerve very broad, fruit-stalks flexuose, capsule ovate striated, lid rostrate. *Musc. Brit. p.* 53. *t.* 16. *Bryum flexuosum, Lightf. p.* 725.

HAB. Marshes, in the plains and on the mountains, abundant.

†† *Nerve narrow.*

+ *Capsule with a struma.*

8. D. *virens*, stems elongated, leaves from a broad sheathing base subulate their margins recurved crisped when dry pointing in all directions, capsule smooth oblongo-cylindrical subcernuous strumose, lid rostrate. *Musc. Brit. p.* 54. *t.* 17.

HAB. Marshy, mountainous situations. Clova and Cairn Gorum, *G. Don.*

9. D. *strumiferum*, stems elongated, leaves from a broad sheathing base subulate entire their margins plane crisped when dry pointing in all directions, capsule furrowed oblongo-ovate subcernuous strumose, lid rostrate. *Musc. Brit. p.* 54. *t.* 17.

HAB. Wet places in the Highland mountains, *D. Don.*

10. D. *falcatum*, stems nearly simple, leaves long lanceolato-subulate falcato-secund nearly entire, capsule ovate subcernuous strumose, lid rostrate. *Musc. Brit. p.* 54. *t.* 17.

HAB. Alpine rocks.

11. D. *Starkii*, stems somewhat branched, leaves lanceolato-subulate falcato-secund entire, capsule oblongo-ovate suberect strumose, lid rostrate. *Musc. Brit. p.* 55. *t.* 17.

HAB. Alpine rocks.

++ *Capsule without a struma.*

12. D. *flavescens*, stems branched, leaves long lanceolate serrulate pointing in all directions crisped when dry, capsule oblong erect, lid rostrate. *Musc. Brit. p.* 55. *t.* 17.

HAB. Wet sandy places. Near Collington, *Mr. Greville.* Appin, *Capt. Carmichael.*

13. D. *squarrosum*, stems somewhat branched, leaves from a broad sheathing base lanceolate obtuse recurved and patent directed to every side crisped when dry, capsule ovate subcernuous, lid rostrate. *Musc. Brit. p.* 55. *t.* 17.

HAB. Very wet situations upon the mountains.

14. D. *pellucidum*, stems branched, leaves lanceolate their margins slightly undulated serrated rather obtuse pointing in all directions, capsule ovate subcernuous, lid rostrate. *Musc. Brit. p.* 55. *t.* 17.

HAB. Sides of streams and rivers. Angus-shire, *G. Don.* Pentland hills, and Collington, *Mr. Greville.*

15. D. *spurium*, stems elongated, leaves fasciculated concave erecto-patent directed to every side ovate, the superior ones lanceolate serrulate, capsule oblong curved, lid rostrate. *Musc. Brit. p.* 56. *t.* 17.

HAB. Bogs, Kinnordy, *C. Lyell, Esq.* Angus-shire, *G. Don.*

16. D. *crispum*, stems short, leaves from a sheathing base setaceous nearly distichous flexuoso-recurved crisped when dry, capsule ovate erect, lid with a long beak. *Musc. Brit. p.* 56. *t.* 17.

HAB. Highlands, *G. Don.* Bog between Paisley and Glasg., *D. Don.*

17. D. *Scottianum*, stems branched, leaves erecto-patent directed to every side subulate their margins plane subserrated crisped when dry, capsule ovato-cylindraceous nearly erect, lid with a long beak. *Musc. Brit. p.* 56. *t.* 18.

HAB. Highlands. Clova mountains, rare, *G. Don.*

18. D. *polycarpum*, stems branched, leaves patent directed to every side lanceolato-subulate their margins recurved flexuose subserrulate crisped when dry, capsule obovate subcernuous, lid rostrate. *Musc. Brit. p.* 57. *t.* 18.

HAB. Ben Lawers, *G. Don.* On rocks, Appin and Lorn, *Capt. Carmichael.* Pentland hills, *Mr. Greville.*

19. D. *undulatum*, stems elongated, leaves nearly plane lanceolate attenuated serrulate at the points transversely undulated, capsule cylindraceous cernuous, lid with a long beak. *Musc. Brit. p.* 57. *t.* 18.

HAB. Marshy places, among the mountains especially.

20. D. *scoparium*, stems elongated, leaves narrow subulate canaliculate secund, capsule cylindraceous arched cernuous, lid with a long beak. *Musc. Brit. p.* 57. *t.* 18. *Bryum scoparium, Lightf. p.* 721.

α. *majus*, stems 3—5 inches in length, leaves falcato-secund. *D. majus, Turn.*

β. *fuscescens*, half the size of the preceding, leaves subsecund narrower somewhat crisped when dry. *D. fuscescens, Turn.*

HAB. Banks and shady places, frequent. β. In moors.

21. D. *varium*, stems short, leaves narrow hastato-lanceolate, capsule ovate, lid rostrate. *Musc. Brit. p.* 58. *t.* 17.

α. *viride*, leaves pointing in all directions lanceolate green, capsules subcernuous. *D. varium, Hedw.*

β. *rufescens*, leaves subsecund lanceolato-subulate reddish, capsules erect. *D. rufescens, Turn.*

Hab. Moist banks and moors.

22. D. *heteromallum*, stems branched, leaves subulate falcato-secund nearly entire, capsule ovate subcernuous, lid with a long beak. *Musc. Brit. p.* 59. *t.* 18. *Bryum heteromallum, Lightf. p.* 726.

Hab. Moist banks.

18. TRICHOSTOMUM.

Fruitstalks terminal. *Peristome* of 16 equal teeth divided to the base, or 32 placed together in pairs. *Calyptra* mitriform. *Musc. Brit. p.* 59. *t.* 2.

* *Fruitstalks curved.*

1. Tr. *patens*, stems elongated, leaves lanceolate acuminate carinated their margins recurved, capsule ovate sulcated, fruitstalks curved, lid conical. *Musc. Brit. p.* 60. *t.* 19 (excluding the Syn. of *Tr. funale Schwægr.*).

β. With long diaphanous hair-like points. *Tr. funale, Schwægr.*

Hab. Highland mountains. β. Upon Trap rock on a hill side, Lorn, *Capt. Carmichael.*

** *Fruitstalks straight.*

† *Leaves with diaphanous points.*

2. Tr. *lanuginosum*, stems elongated subpinnate, leaves lanceolato-subulate acuminate, their long diaphanous points serrated margins recurved, capsules ovate, fruitstalks short on lateral branches, lid rostrate. *Musc. Brit. p.* 60. *t.* 19. *Bryum hypnoides, Lightf. p.* 732.

Hab. Mountains, abundant.

3. Tr. *canescens*, stems elongated irregularly branched, leaves ovato-lanceolate, their diaphanous acuminated points slightly serrated, capsule ovate, teeth of the peristome very long and filiform, lid subulate. *Musc. Brit. p.* 61. *t.* 19.

Hab. Heaths and mountainous plains.

4. Tr. *heterostichum*, stems elongated branched, leaves ovato-lanceolate, their diaphanous acuminated points slightly serrated, capsule oblong, teeth of the peristome rather short, lid rostrate. *Musc. Brit. p.* 61. *t.* 19.

Hab. Stones in mountainous districts.

5. Tr. *microcarpon*, stems elongated branched, leaves lanceolate their diaphanous acuminated points slightly serrated, capsule oblong, teeth of the peristome rather short, lid rostrate. *Musc. Brit. p.* 61. *t.* 19.

Hab. Rocks, frequent.

†† *Leaves never diaphanous at their points.*

6. Tr. *aciculare*, stems elongated branched, leaves lanceolate obtuse serrulated at the points, their nerve disappearing below the summit, capsule oblong, lid rostrate. *Musc. Brit. p.* 62. *t.* 19. *Bryum aciculare, Lightf. p.* 725.

Hab. In rivulets, or on very wet stones and rocks.

7. Tr. *fasciculare*, stems elongated branched, leaves lanceolate entire their summits never diaphanous their margins recurved, capsule ovato-oblong, lid rostrate. *Musc. Brit. p.* 62. *t.* 19.

Hab. Rocks among the mountains.

8. Tr. *polyphyllum*, stems branched, leaves lanceolato-subulate their margins recurved serrated above very much crisped when dry, capsule oblong, lid rostrate. *Musc. Brit. p.* 62. *t.* 19.

Hab. Rocks and walls in mountainous places.

19. LEUCODON.

Fruitstalks lateral. *Peristome* single, of 32 teeth closely united in pairs. *Calyptra* dimidiate. *Musc. Brit. p.* 63. *t.* 2.

1. L. *sciuroides*, leaves closely imbricated ovato-cordate acuminate striated, capsule oblong. *Musc. Brit. p.* 63. *t.* 20.

Hab. Trunks of trees, near Dunkeld, rare, *G. Don.*

20. DIDYMODON.

Fruitstalks terminal. *Peristome* single, of 16 or 32 teeth approaching in pairs, or united at the base. *Calyptra* dimidiate. *Musc. Brit. p.* 64. *t.* 2.

* *Capsules inclined.*

1. D. *purpureum*, stems scarcely branched, leaves lanceolate acuminate carinated their margins recurved entire, capsule ovato-cylindraceous oblique substrumose furrowed when dry, lid conical. *Musc. Brit. p.* 65. *t.* 20. *Dicranum, Hedw. Bryum purp., Lightf. p.* 734.

Hab. On the ground and moist banks, abundant.

2. D. *inclinatum*, leaves bifarious from a sheathing base subulate, capsule ovate inclined, lid conical. *Musc. Brit. p.* 65. *t.* 20.

Hab. Rocky places. Near Barrie, Angus-shire, *D. Don.*

** *Capsules erect.*

3. D. *flexifolium*, stems more or less elongated, leaves oblongo-ovate flexuose strongly serrated at the point, capsules erect cylindraceous, lid rostrate. *Musc. Brit. p.* 66. *t.* 20.

Hab. Near Oban, on the ground, *Capt. Carmichael.*

4. D. *rigidulum*, leaves closely imbricated on all sides lanceolate much acuminated carinated with the rigid nerve running beyond the point, capsule oblongo-ovate erect, lid rostrate. *Musc. Brit. p.* 67. *t.* 20.

Hab. Walls and rocks. Angus-shire, *G. Don.*

5. D. ***trifarium***, leaves rather distant somewhat trifarious lanceolate rather obtuse carinated with the nerve scarcely reaching to the point, capsule oblongo-ovate erect, lid rostrate. *Musc. Brit. p.* 67. *t.* 20.

Hab. Moist banks. Ravines of Lorn, *Capt. Carmichael.* Pentlands and coast of Fife, *Mr. Greville.* Highlands, *G. Don.*

6. D. ***capillaceum***, stems elongated, leaves nearly distichous subulato-setaceous, capsule erect ovato-cylindraceous, lid conical. *Musc. Brit. p.* 67. *t.* 20.

Hab. Banks and rocks in mountainous situations.

7. D. ***heteromallum***, stems rather short, leaves subsecund subulate, capsule ovato-cylindraceous, lid conical. *Musc. Brit. p.* 68. *t.* 20.

Hab. Pentland hills and Fifeshire coast, *Mr. Greville.* Kinross-shire, Loch Earne, &c. *Mr. Arnott.*

b. *Peristome double.*

21. FUNARIA.

Fruitstalks terminal. *Peristome* double oblique; the *outer* of 16 teeth, the inner of 16 teeth opposite to those of the outer. *Musc. Brit. p.* 69. *t.* 2.

1. F. ***hygrometrica***, leaves very concave ovate apiculate entire, nerve excurrent, fruitstalk curved flexuose. *Musc. Brit. p.* 69. *t.* 20.

Hab. Old walls and buildings, and dry and barren soils in almost every situation.

2. F. ***Muhlenbergii***, stems short, leaves concave ovate suddenly acuminated serrated, nerve disappearing below the point, fruitstalks straight. *Musc. Brit. p.* 69. *t.* 20.

Hab. Among rocks, principally calcareous. Rocks of Lismore, not rare, *Capt. Carmichael.*

22. ZYGODON.

Fruitstalks terminal. *Peristome* double; the *ext.* of 16 teeth approaching in pairs, the *int.* of as many horizontal ciliary processes. *Calyptra* dimidiate, glabrous. *Musc. Brit. p.* 70. *t.* 3.

1. Z. ***conoideum***, *Musc. Brit. p.* 71. *t.* 21.

Hab. Rare. Trunks of trees, near Inverary. Ash trees and hazel bushes, Lorn, *Capt. Carmichael.*

Tufted. *Leaves* erecto-patent, ovate and lanceolate, dotted, entire; the nerve reaching to the point. *Capsule* ovate, erect, with a slight apophysis, furrowed.

23. ORTHOTRICHUM.

Fruitstalks terminal. *Peristome* double; the *ext.* of 16 teeth approaching in pairs, the *inner* (usually) of as many ciliary processes lying horizontally. *Calyptra* mitriform, sulcate, more or less hairy. *Musc. Brit. p.* 72. *t.* 2.

* *Peristome without ciliary processes.*

1. O. ***anomalum***, leaves lanceolate erecto-patent, fruitstalks exserted, peristome of 8 double teeth, calyptra slightly pilose. *Musc. Brit. p.* 72. *t.* 21.

HAB. Rocks and walls.

2. O. *cupulatum*, leaves lanceolate erecto-patent, capsule nearly sessile, peristome of 16 double teeth, calyptra slightly pilose. *Musc. Brit. p.* 72. *t.* 21.

HAB. Trees and stones.

** *Peristome with 8 ciliary processes.*

3. O. *crispum*, leaves lanceolato-subulate much crisped when dry, fruitstalks much exserted, capsule striated, peristome with 8 ciliary processes, calyptra very pilose. *Musc. Brit. p.* 73. *t.* 21.

HAB. Trees and stones.

4. O. *Hutchinsiæ*, leaves lanceolate erect and nearly straight when dry, fruitstalks much exserted, capsule striated, peristome with 8 ciliary processes, calyptra very pilose. *Musc. Brit. p.* 73. *t.* 21.

HAB. Rocks and stones, Lorn and Appin, *Capt. Carmichael.*

5. O. *affine*, leaves patent broadly lanceolate, capsules sessile, peristome with 8 ciliary processes, calyptra subpilose. *Musc. Brit. p.* 74. *t.* 21.

α. *majus*, stems elongated, calyptra, especially above, pilose. *O. affine, Schrad.*

β. *pumilum*, stems very short, calyptra glabrous. *O. pumilum, Swartz.*

HAB. Common on rocks and trees, both α. and β.

*** *Peristome with 16 ciliary processes.*

6. O. *diaphanum*, stems short, leaves lanceolate acuminated their points diaphanous, capsule sessile, peristome with 16 ciliary processes, calyptra subpilose. *Musc. Brit. p.* 74. *t.* 21.

HAB. Stone walls, rocks and trees.

7. O. *pulchellum*, stems short, leaves patent narrow-lanceolate crisped when dry, fruitstalks exserted, peristome with 16 slender ciliary processes, calyptra subpilose. *Musc. Brit. p.* 75. *t.* 21.

HAB. Trunks of trees and stones, Lorn, *Capt. Carmichael.* Trees near Dalkeith, *G. Don.* Rosslyn, Arlary, &c. *Mr. Arnott.*

8. O. *rivulare*, stems elongated much branched, leaves broadly lanceolate obtuse, capsules sessile, peristome with 16 slender ciliary processes, calyptra glabrous. *Musc. Brit. p.* 75. *t.* 21.

HAB. Stones in the Cart and in the burn at Calderwood, *D. Don.*

9. O. *striatum*, stems elongated branched, leaves lanceolate patent slightly twisted when dry, capsule sessile ovate smooth, peristome with 16 torulose ciliary processes, calyptra subpilose. *Musc. Brit. p.* 75. *Polytrichum striatum, Lightf. p.* 704.

HAB. Trunks of trees.

10. O. *Lyellii*, stems elongated much branched, leaves long linear lanceolate recurvo-patent much crisped when dry, capsule ob-

long striated, peristome with 16 rather broad distinctly jointed ciliary processes, calyptra very hairy. *Musc. Brit. p.* 76. *t.* 22.

Hab. Trunks of trees. About Arlary, Kinross-shire, on ash and fruit trees, and gooseberry bushes, plentiful; also, in Perthshire, more plentiful than any other *Orthotrichum*, *Mr. Arnott.* Near Glamis, *D. Don.*

24. NECKERA.

Fruitstalks lateral. *Peristome* double; the *outer* of 16 teeth, the *inner* of 16 cilia, connected only at the very base by a short membrane. *Calyptra* dimidiate.

1. N. *pumila*, leaves ovato-acuminate slightly concave their margins recurved, fruitstalks scarcely longer than the perichætial leaves, capsule oblongo-ovate. *Musc. Brit. p.* 77. *t.* 22.

Hab. Trees, at Inverary, *Mr. Turner* and *Hook.* Angus-shire, *G. Don.* Cliesh woods, Kinross-shire, *Mr. Arnott.*

2. N. *crispa*, leaves oblong acuminulate transversely wrinkled, fruitstalks much exserted, capsule ovate. *Musc. Brit. p.* 78. *t* 22. *Hypnum crispum. p.* 745.

Hab. Trunks of trees and rocks.

25. ANOMODON.

Fruitstalks lateral. *Peristome* double, consisting of 16 teeth, with the ciliary process arising from each tooth. *Calyptra* dimidiate. *Musc. Brit. p.* 79. *t.* 3.

1. A. *curtipendulum*, leaves ovate acuminate serrulate the nerve disappearing below the point, fruitstalk twice as long as the perichætial leaves, capsule ovate. *Musc. Brit. p.* 79. *t.* 22.

Hab. On the ground, rocks and trees. Pentland hills, *Mr. Greville.* Common in Lorn, *Capt. Carmichael.*

2. A. *viticulosum*, leaves ovato-lanceolate obtuse entire, the nerve reaching to the point, fruitstalks very long, capsule cylindrical. *Musc. Brit. p.* 80. *t.* 22. *Hypnum viticulosum, Lightf. p.* 754.

Hab. Rocks and stones, frequent. In fruit, at Lismore, *Capt. Carmichael.*

26. FONTINALIS.

Fruitstalks lateral. *Peristome* double; the *ext.* consisting of 16 teeth; the *inner* of 16 cilia connected by transverse bars, and forming a reticulated cone. *Calyptra* mitriform. *Musc. Brit. p.* 81. *t.* 3.

1. F. *antipyretica*, leaves nerveless for the most part complicato-carinate. *Musc. Brit. p.* 82. *t.* 22. *Lightf. p.* 695.

Hab. Rivers and lakes. Appin, *Capt. Carmichael.* River Esk, at Rosslyn, and in the Logan water, Pentland hills, *Mr. Greville.*

Used by the Swedes, Linnæus tells us, to stuff between the woodwork of their chimneys, to prevent their catching fire; whence the specific name.

2. F. *squamosa*, leaves nerveless plane or very slightly concave. *Musc. Brit. p.* 82. *t.* 22. *Lightf. p.* 697.

HAB. Subalpine rivulets, common.

3. F. *capillacea*, leaves nerved slightly concave. *Musc. Brit. p.* 83. *t.* 22.

HAB. Alpine rivulets, *Dickson.*

27. BUXBAUMIA.

Capsule oblique, gibbous. *Peristome* double; the *ext.* of numerous, filiform, jointless processes; the *interior* a plicate membranous cone. *Calyptra* mitriform.

1. B. *aphylla.* *Musc. Brit. p.* 84. *t.* 22.

HAB. On the ground, near Rosslyn, *Mr. E. Maughan.* Wood near Aberdeen, *Mr. Jackson.* Selkirkshire, near the borders of Peeblesshire, *Mr. J. Stewart.*

Peduncles about an inch high, red, tuberculate, arising from a small brown, oblong, apparently scaly bulb; their scales, however, are really leaves, very minute, and cut into a number of capillary segments, membranous, without nerve, but strongly reticulated, and resemble the leaves of some *Jungermanniæ.* *Capsule* nearly plane above, gibbous beneath, inclined, having at its base a small cylindrical apophysis.

This is a most remarkable plant, having little resemblance to any other moss; and to me it is rendered more interesting, as I was, when a very young Botanist, the first discoverer of it, as a native of Britain. Yet, notwithstanding the labour I had bestowed, in drawing and describing it for the *Flora Londinensis,* I entirely overlooked the true nature of the scale-like processes upon the little bulbs at the base, which Mr. Brown has ascertained to be *leaves.* Noble specimens from Selkirkshire, some with 2 or more peduncles arising from the same bulb, have been communicated to me by the late Mr. J. Stewart of Edinburgh, a gentleman of high botanical attainments, from whom I had hoped to have received much assistance in the course of the present publication; but whose death, unfortunately for science, occurred ere the first sheet was sent to the press. He died at an early age, while on the eve of a voyage to South America, a victim to intense application to literary pursuits.

28. BARTRAMIA.

Fruitstalks terminal. *Capsule* subglobose. *Peristome* double; the *ext.* of 16 teeth; the *interior* of a membrane divided into 16 bifid segments. *Calyptra* dimidiate. *Musc. Brit. p.* 85. .3.

* *Fruitstalks long, straight (not curved).*

1. B. *pomiformis*, leaves patent subulate strongly serrated the nerve reaching to the summit twisted when dry. *Musc. Brit. p.* 85. *t.* 23. *Bryum pomiforme, Lightf. p.* 717.

α. minor, stems short, leaves flexuose. *B. pomiformis, Hedw.*

β. major, stems much lengthened and branched, leaves longer crisped especially when dry. *B. crispa, Swartz.*

Hab. Heaths and dry banks. *β*. Principally in subalpine countries.

2. B. *ithyphylla*, stems short, leaves rigid erecto-patent subulato-setaceous almost entire, the nerve half way up passing into the substance of the leaf, straight when dry, fruitstalks much elongated. *Musc. Brit. p.* 86. *t.* 23.

Hab. Dry banks, principally in mountainous situations. Ben Lomond; banks in Sutherland, and on Ben Luyal, *Hook.* Ben Lawers, &c., *G.* and *D. Don.*

3. B. *gracilis*, stems elongated, leaves recurvo-patent lanceolate canaliculate serrated, fruitstalks lateral from innovations. *Musc. Brit. p.* 86. *t.* 23.

Hab. Rocks in alpine districts, not uncommon; especially in wet places, by cascades.

4. B. *fontana*, stems fastigiate, leaves closely imbricated rigid erect broadly ovate or lanceolate acuminated nearly plane serrated, fruitstalks lateral from innovations. *Musc. Brit. p.* 87. *t.* 23. *Mnium fontanum, Lightf. p.* 709.

α. major, stems from 3—6 inches in length, leaves broadly ovate acuminated. *B. fontana, Swartz.*

β. marchica, stems from half an inch to an inch in length, leaves lanceolate acuminated. *B. marchica, Swartz* and *E. B.*

Hab. Marshy and boggy places, frequent. *β*. Clova hills, *D. Don.*

** *Fruitstalks very short, curved.*

5. B. *Halleriana*, stems much elongated proliferous, leaves long subulate flexuose serrated above, fruitstalks lateral from innovations very short curved. *Musc. Brit. p.* 87. *t.* 23. *Bryum laterale, Lightf. p.* 727.

Hab. Crevices of rocks in alpine situations, abundant.

6. B. *arcuata*, stems much elongated proliferous, leaves horizontally patent ovato-lanceolate acuminated serrated striated, fruitstalks very short arcuate at length lateral, capsule nearly smooth. *Musc. Brit. p.* 88. *t.* 23.

Hab. Rocks and banks in the Highlands, not uncommon. Abundant along the shores of Loch Lomond. Ben Lawers and Clova, *G. Don.* Moist heathy ground, Lorn and Appin, *Capt. Carmichael.* Cathil Muir, Kinross-shire, rare in fr., *Mr. Arnott.* Pentland hills, without fr., *Mr. Greville.*

29. HOOKERIA (*Smith, not Schwægr.*).

Fruitstalks lateral. *Peristome* double; the *exterior* of 16 teeth, the *interior* of a membrane divided into 16 entire segments. *Calyptra* mitriform. *Musc. Brit. p.* 89. *t.* 3.

1. H. *lucens*, leaves broadly ovate entire obtuse nerveless. *Musc. Brit. p.* 89. *t.* 27. *Hypnum lucens, Lightf. p.* 743.

HAB. Moist banks in woods and among rocks.

Leaves with very large cellules. *Capsule* horizontally inclined, dark purple brown, reticulated. *Calyptra* pitted, almost white.

30. HYPNUM.

Fruitstalks lateral. *Peristome* double; the *ext.* of 16 teeth; the *interior* of a membrane cut into 16 equal segments, with filiform processes frequently placed between them. *Calyptra* dimidiate. *Musc. Brit. p.* 91. *t.* 3.

DIV. I. *Stems* (*taken in conjunction with the leaves*) *plane.*

SECT. I. *Capsules erect.*

1. H. *trichomanoides*, leaves broadly scymetar-shaped serrated at the point, nerve reaching to the middle of the leaf, capsule ovate erect, lid rostrate. *Musc. Brit. p.* 91. *t.* 24.

HAB. Trunks of trees, not rare.

2. H. *complanatum*, leaves oblong apiculate entire nerveless, capsule ovate erect, lid rostrate. *Musc. Brit. p.* 91. *t.* 24. *Lightf. p.* 742.

HAB. Trunks of trees, common.

These two species have the habit of *Neckera.*

SECT. II. *Capsules cernuous or inclined.*

3. H. *riparium*, leaves ovato-lanceolate acuminated entire the nerve reaching nearly to the summit, capsules oblong cernuous, lid conical. *Musc. Brit. p.* 92. *t.* 24. *Lightf. p.* 760.

HAB. Banks of rivers and lakes, and spots occasionally overflowed with water.

4. H. *undulatum*, leaves ovate acute transversely undulated, with 2 faint nerves at the base, capsule oblong furrowed arcuato-cernuous, lid rostrate. *Musc. Brit. p.* 92. *t.* 24. *Lightf. p.* 744.

HAB. Woods and dry heathy places. Plentiful in the Highlands.

5. H. *denticulatum*, leaves ovate sometimes approaching to lanceolate more or less acuminated having 2 short nerves at the base, capsule oblongo-cylindraceous inclined, lid conical. *Musc. Brit. p.* 92. *t.* 24. *Lightf. p.* 741.

α. angustifolium, leaves ovato-lanceolate distant quite plane. *H. denticulatum, Linn.*

β. obtusifolium, leaves ovate more or less obtuse slightly concave. *H. Donianum, E. B.*

HAB. Principally in woods. *β.* Among the mountains, *G.* and *D. Don.* Cairn-gorum, *Mr. Winch.*

DIV. II. *Stems (taken in conjunction with the leaves) more or less cylindrical, never plane.*

SECT. I. *Leaves spreading on all sides of the stem*[a].

A. *Leaves uniform in their direction (not squarrose).*

a. *Nerve reaching to or beyond the point.*

* *Leaves without serratures.*

6. H. *medium*, leaves ovate obtuse concave entire, nerve reaching to the summit, capsule cylindrical nearly erect, lid conical. *Musc. Brit p.* 93. *t.* 24.

HAB. Stumps of trees, &c., by the banks of rivers.

7. H. *tenellum*, leaves fasciculate erect lanceolato-subulate entire their nerve reaching to the summit, capsules ovate cernuous, lid rostrate. *Musc. Brit. p.* 93. *t.* 24.

HAB. Rocks and walls. Cave near Kirkcaldy, and Den of Dupplin, *Mr. Arnott.* Craig Lochart, near Edinb., *Mr. Greville.*

8. H. *serpens*, leaves ovato-lanceolate rather obtuse patent entire their nerve for the most part reaching to the summit (sometimes obsolete), capsule cylindrical curved cernuous, lid conical. *Musc. Brit. p.* 94. *t.* 24. *Lightf. p.* 763.

HAB. Moist banks, trunks of trees, on pales and decayed wood in various situations.

** *Leaves serrated.*

9. H. *populeum*, leaves lanceolate acuminated serrated the margin slightly reflexed, nerve reaching to the point, capsule ovate nearly erect, fruitstalks rough, lid conical. *Musc. Brit. p.* 94. *t.* 24.

HAB. Trees and rocks. Slateford, near Edinburgh, *Mr. Arnott.* Ben Lawers, Clova, &c., *G. Don.*

10. H. *reflexum*, leaves cordato-acuminate serrated their nerve reaching to the point their margin slightly reflexed, capsule ovate cernuous, fruitstalks rough, lid conical. *Musc. Brit. p.* 95. *t.* 24.

HAB. On the ground, Ben Nevis, near the base of the mountain.

b. *Nerves shorter than the leaf, or none.*

* *Leaves entire.*

† *Leaves ovate or elliptical.*

11. H. *molle*, leaves loosely imbricated rotundato-ovate obtuse concave entire faintly two-nerved at the base or with one short nerve, capsule ovate cernuous, lid conical. *Musc. Brit. p.* 95. *t.* 24.

HAB. Alpine rivulets, *Dickson, Hook.* In Angus-, Aberdeen-, and Inverness-shires, *G. Don.* Argyleshire, *Capt. Carmichael.*

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[a] In opposition to "*leaves secund.*"

12. H. *Schreberi*, leaves closely imbricated nearly erect elliptical apiculate concave entire faintly two-nerved at the base, capsule ovate cernuous, lid conical. *Musc. Brit. p.* 96. *t.* 24.

Hab. Woods and heaths, not uncommon.

13. H. *stramineum*, leaves loosely imbricated erecto-patent oblongo-ovate obtuse entire their nerve reaching half way, capsule oblongo-ovate curved cernuous, lid conical. *Musc. Brit. p.* 97. *t.* 24.

Hab. Wet bogs, among other mosses. Argyleshire, *Capt. Carmichael.*

14. H. *murale*, leaves nearly erect imbricated oval with a very short point concave entire nerve reaching about half way up, capsule ovate cernuous, lid rostrate. *Musc. Brit. p.* 97. *t.* 24.

Hab. Walls and stones, Angus-shire, *G. Don.* Banks of the Cart, near the mill, Glasgow, and on the Ochill hills, *D. Don.*

15. H. *purum*, leaves closely imbricated oval with a very short point very concave their nerve reaching half way up, capsule ovate cernuous, lid conical. *Musc. Brit. p.* 98. *t.* 24. *Lightf. p.* 758.

Hab. Woods, banks, &c. common.

Used by the fishermen in Lancashire to scour their worms, according to Dillenius, whence the specific name.

†† *Leaves lanceolate or subulate.*

+ *Leaves without striæ.*

16. H. *plumosum*, leaves erecto-patent, the upper ones sometimes secund, all of them ovato-lanceolate acuminated subserrated, the nerve reaching about half way, capsule ovate cernuous, lid conical. *Musc. Brit. p.* 98. *t.* 25.

Hab. Moist banks, rocks, &c. Pentland hills, Angus-shire, &c.

17. H. *pulchellum*, leaves loosely imbricated the upper ones subsecund all of them lanceolato-acuminate entire nerveless, capsules ovato-cylindrical nearly erect, lid conical. *Musc. Brit. p.* 99. *t.* 25.

Hab. Woods in alpine situations and among rocks. Caldron Linn and Habbie's How, *Mr. Arnott.* Argyleshire, *Capt. Carmichael.*

++ *Leaves striated.*

18. H. *rufescens*, leaves erecto-patent lanceolate acuminated entire striated faintly two-nerved at the base, capsule ovate nearly erect, lid conical. *Musc. Brit. p.* 99. *t.* 25.

Hab. Alpine districts, rare. Falls of Moness, *Mr. Borrer.* Argyleshire, *Capt. Carmichael.*

19. H. *sericeum*, leaves erecto-patent lanceolate acuminated entire striated, nerve running to three-fourths of the length, capsule ovato-cylindrical erect, lid conical. *Musc. Brit. p.* 100. *t.* 25. *Lightf. p.* 762.

Hab. Trunks of trees, walls, rocks, &c., common.

20. H. *lutescens*, leaves erecto-patent lanceolate acuminated en-

tire striated, nerve disappearing below the point, capsule ovate cernuous, fruitstalks rough, lid conico-acuminate. *Musc Brit. p*. 100. *t*. 25.

Hab. Banks and stems of trees, and bushes near the ground.

21. H. *nitens*, leaves erecto-patent narrow-lanceolate acuminated nearly entire striated, nerve running nearly to the summit, capsule oblongo-ovate curved cernuous, fruitstalks smooth, lid conical. *Musc. Brit. p*. 100. *t*. 25.

Hab. Bogs, *Dickson*. Argyleshire, *Capt. Carmichael.* Pentlands, in many spots, *Mr. Greville.*

22. H. *albicans*, leaves erecto-patent ovato-lanceolate acuminated striated entire, nerve reaching half way up, capsules ovate cernuous, fruitstalks smooth, lid conical. *Musc. Brit. p*. 101. *t*. 25.

Hab. Pentland hills, *Mr. Arnott* and *Greville.*

*** Leaves serrated.*

† *Stems below bare of leaves.*

23. H. *alopecurum*, stems erect below simple and naked fascicled above, leaves concave ovate elliptical acute serrated, nerve running nearly to the point, margin reflexed, capsule ovate cernuous, lid rostrate. *Musc. Brit. p*. 101. *t*. 25. *Lightf. p*. 757.

Hab. Woods and shady banks, frequent.

24. H. *dendroides*, stems erect below simple and naked fascicled above, leaves ovate often more or less lanceolate striated serrated at the point, nerve reaching nearly to the summit, capsule erect ovato-cylindrical, lid rostrate. *Musc. Brit. p*. 101. *t*. 25. *Lightf. p*. 756.

Hab. Woods and bushy places. Guillon Links, Edinburgh, in fr. *Mr. Arnott.*

†† *Stems leafy below.*

+ *Capsules erect.*

25. H. *myosuroides*, branches fascicled curved, leaves lanceolato-acuminate serrated, margins reflexed at the base their nerve disappearing near the middle, capsule ovato-cylindrical erect, lid rostrate. *Musc. Brit. p*. 102. *t*. 25. *Lightf. p*. 765.

Hab. Woods.

26. H. *curvatum*, branches fascicled curved, leaves ovato-elliptical concave serrated at the points, nerve disappearing beyond the middle, capsule ovate erect, lid rostrate. *Musc. Brit. p*. 102. *t*. 25. *H. sciuroides, Lightf. p*. 764.

Hab. Rocks, common.

+ + *Capsules cernuous.*

§ *Stems bi-tripinnate.*

27. H. *splendens*, stems tripinnate, leaves ovate with a suddenly acuminated serrated point concave faintly two-nerved at the base, margin below recurved, capsule ovate cernuous, lid rostrate. *Musc. Brit. p*. 103. *t*. 25. *H. parietinum, Lightf. p*. 750.

Hab. Heaths, woods, and hedge-banks.

28. H. ***proliferum***, stems mostly tripinnate, leaves serrated papillose on the back, the cauline ones cordato-acuminate striated, with the nerve running nearly to the point, those of the branches more ovate with a single or double nerve at the base. *Musc. Brit. p.* 103. *t.* 25. *Lightf. p.* 750.

Hab. Woods, banks, heathy places, &c., common.

29. H. ***prælongum***, stems subbipinnate, leaves distantly placed patent cordate or ovate acuminated serrated, nerve disappearing below the summit, capsule ovate cernuous, lid rostrate. *Musc. Brit. p.* 103. *t.* 25. *Lightf. p.* 751.

Hab. Shady banks, trunks of trees, &c., common.

§§ *Stems pinnated, or irregularly branched.*

30. H. ***flagellare***, stems pinnate (or irregularly bipinnate), leaves thickly set cordato-acuminate serrated very faintly two-nerved at the base, capsule oblong cernuous, lid conical. *Musc. Brit. p.* 104. *t.* 25.

Hab. Ben Lawers, *G. Don.* Argyleshire, *Capt. Carmichael.*

31. H. ***piliferum***, stems somewhat pinnated, leaves ovate with a long narrow acumination serrated, nerve disappearing below the middle, capsule ovate cernuous, lid rostrate. *Musc. Brit. p.* 105.

Hab. Banks, &c. In fruit at Braid hermitage, *Mr. Arnott.*

32. H. ***rutabulum***, stems variously branched, leaves patent ovate acuminated serrated at the points striated their nerve reaching half way, capsule ovate cernuous, fruitstalk rough, lid conical. *Musc. Brit. p.* 105. *t.* 26. *Lightf. p.* 747.

Hab. Trees and banks, extremely common.

33. H. ***velutinum***, stems variously branched, leaves erecto-patent ovate often approaching to lanceolate acuminated serrated striated, nerve reaching half way, capsule ovate cernuous, fruitstalk rough, lid conical. *Musc. Brit. p.*105. *t.* 26. *Lightf. p.* 763.

Hab. Woods and hedge-banks, common.

34. H. ***ruscifolium***, stems variously branched, leaves loosely imbricated subpatent broadly ovate acute serrated concave, their nerve reaching nearly to their summit, capsule ovate cernuous, lid rostrate. *Musc. Brit. p.* 106. *t.* 26. *H. rutabulum* β., *Lightf. p.* 747.

Hab. Stones in rivers, &c., common.

35. H. ***striatum***, stems variously branched, leaves patent cordato-acuminate serrated striated, nerve reaching beyond the middle, capsule oblongo-ovate cernuous, fruitstalk smooth, lid rostrate. *Musc. Brit. p.* 106. *t.* 26.

Hab. Woods, stones, banks, &c.

36. H. ***confertum***, stems variously branched, leaves erecto-patent ovate acuminated concave serrated, their nerve reaching half

way, capsule ovate cernuous, fruitstalk smooth, lid rostrate. *Musc. Brit. p* 106. *t.* 26.

Hab. Trunks of trees, old rails, and banks. Slateford, *Mr. Arnott.* Trees, not unfrequent, *D. Don.*

B. *Leaves squarrose.*

37. H. *cuspidatum*, **leaves loosely set ovate concave nerveless entire the lower ones squarrose those at the summit closely imbricated into a cuspidate point, capsule oblong curved cernuous, lid conical.** *Musc. Brit. p.* 107. *t.* 26. *Lightf. p.*761.

Hab. Bogs, common.

38. H. *cordifolium*, leaves loosely set squarrose cordato-ovate obtuse concave entire, their nerve running very nearly to the point, capsule oblong curved cernuous, lid conical. *Musc. Brit. p.* 107. *t.* 26.

Hab. Marshes and bogs. Fruit rare about Edinburgh. In fruit, in Lismore, Argyleshire, *Capt. Carmichael.*

39. H. *stellatum*, leaves loosely set squarrose cordate much acuminated entire nerveless, capsule oblongo-ovate curved cernuous, lid conical. *Musc. Brit. p.* 108. *t.* 26.

α. majus. H. stellatum, Schreb.

β. minus. H. squarrosulum, E. B.

Hab. *α.* In marshes. *β.* On rocks and loose stones.

40. H. *loreum*, leaves recurved squarrose lanceolate much acuminated concave serrated striated faintly two-nerved at the base, capsule globoso-ovate cernuous, lid conical. *Musc. Brit. p.* 108. *t.* 26.

Hab. Woods, heaths, and among bushes, common.

41. H. *triquetrum*, leaves squarrose cordato-acuminate gradually tapering nearly plane striated faintly two-nerved at the base, capsule ovato-globose, lid short conical. *Musc. Brit. p.* 108. *t.* 26 (*excluding the var. β.*). *Lightf. p.* 746.

Hab. Woods, abundant.

Five or six inches long, very stout.

42. H. *brevirostre*, leaves squarrose broadly ovate concave without striæ acuminated suddenly and with an evident contraction so as to terminate in a long hair-like point minutely serrated two-nerved at the base, capsule ovate, lid conical. *H. brevirostre, Ehrh.* (*not E. B.*) *H. triquetrum β., Musc. Brit. p.* 108.

Hab. Woods in Argyleshire, *Capt. Carmichael.*

A recent examination of this handsome species has satisfied me of its being quite distinct from *H. triquetrum*, with which I had formerly confounded it. Besides the characters above given, I may add, it is not half the size, it is more straggling, branches slender, leaves vastly smaller, and more serrated.

43. H. *squarrosum*, leaves squarrose widely cordate very much

acuminated and recurved serrated faintly two-nerved at the base, capsule ovato-globose cernuous, lid conical. *Musc. Brit. p.* 109. *t.* 26. *Lightf. p.* 755.

Hab. Woods and heaths, common.

Sect. II. *Leaves secund.*

A. *Leaves with a single nerve.*

44. H. ***filicinum***, stems subbipinnated, leaves especially the upper ones falcato-secund broadly ovate acuminated serrated their nerve reaching to the point, capsule oblongo-ovate curved cernuous, lid conical. *Musc. Brit. p.* 109. *t.* 26. *Lightf. p.* 748.

Hab. Bogs and sides of rivulets.

45. H. ***atro-virens***, stems variously branched procumbent, leaves all of them slightly secund broadly ovate with an attenuated obtuse point, nerve running nearly to the summit, capsule ovate cernuous, lid conical. *Musc. Brit. p.* 109. *t.* 26.

Hab. Trees, rocks, and banks. By the Clyde, near Blantyre Priory, *D. Don.*

46. H. ***palustre***, leaves secund ovate somewhat acuminate concave entire the margins incurved above, nerve short often forked sometimes obsolete, capsule oblongo-ovate cernuous, lid conical. *Musc. Brit. p.* 110. *t.* 26.

Hab. Marshes, rivulets, &c., especially in the Highlands.

47. H. ***fluitans***, leaves loosely imbricated the upper ones falcato-secund, all of them lanceolato-subulate scarcely serrated at their point nearly plane, the nerve disappearing just below the summit, capsule ovato-oblong curved cernuous, lid conical. *Musc. Brit. p.* 98. *t.* 24.

Hab. Marshy places; Pentland hills, *Mr. Greville.*

48. H. ***aduncum***, leaves closely imbricated all of them falcato-secund narrow lanceolate concave or almost semicylindrical entire, the nerve disappearing above the middle, capsule oblongo-ovate curved cernuous, lid conical. *Musc. Brit. p.* 111. *t.* 26. *Lightf. p.* 753.

α. ***revolvens***, leaves narrow very much falcated. *H. aduncum, Linn. H. revolvens, E. B.*

β. ***rugosum***, leaves broader less falcate somewhat rugose. *H. rugosum, E. B.*

Hab. Bogs, common. *β.* Clova and Forfar; Campsie and Ochill hills, *G.* and *D. Don.*

49. H. ***uncinatum***, leaves falcato-secund lanceolato-subulate serrated striated, nerve disappearing below the point, capsule cylindrical curved cernuous, lid conical. *Musc. Brit. p.* 111. *t.* 26.

Hab. Moors and rocks, among other mosses.

50. H. *commutatum*, stems pinnated, leaves falcato-secund cordate very much acuminated serrated their margins reflexed, nerve disappearing below the summit, capsule oblongo-ovate curved cernuous, lid conical. *Musc. Brit. p.* 112. *t.* 27.

Hab. Wet rocks. Pentland hills, &c., *Mr. Greville.*

B. *Leaves destitute of a nerve, or furnished with a very indistinct one at the base.*

51. H. *scorpioides*, leaves secund broadly ovate ventricose obtuse entire nerveless, capsules oblongo-ovate curved cernuous, lid conical. *Musc. Brit. p.* 112. *t.* 27. *Lightf. p.* 754.

Hab. Bogs, common.

52. H. *Silesianum*, leaves loosely imbricated secund narrow lanceolate acuminated serrated nerveless or very obscurely 2-nerved, capsule subcylindrical erecto-cernuous, lid conical obtuse. *Musc. Brit. p.* 113. *t.* 27.

Hab. Summit of Ben Luyal, in Sutherland, *Hook.*

53. H. *cupressiforme*, leaves closely imbricated more or less falcato-secund lanceolate acuminated entire except at the points which are usually serrated, very faintly 2-nerved at the base, capsule cylindrical erecto-cernuous, lid conical with a point. *Musc. Brit. p.* 113. *t.* 27. *Lightf. p.* 752.

α. *vulgaris*, stems broad semicylindrical, leaves falcato-secund. *H. cupressiforme, Linn.*

β. *compressum*, stems slender compressed, leaves falcato-secund. *H. compressum, Linn. Mant.*

γ. *tenue*, stems very slender, leaves very slightly curved narrow-lanceolate quite entire. *H. polyanthos, E. B.*

Hab. Banks and trunks of trees, every where. β. Abundant in woods. γ. Mostly on trees. Angus-shire, *D. Don.*

54. H. *Crista-castrensis*, stems closely pectinated, leaves falcato-secund ovato-lanceolate acuminated serrulate striated faintly 2-nerved at the base, capsule oblongo-ovate curved cernuous, lid conical. *Musc. Brit. p.* 114. *t.* 27.

Hab. On the ground, rare. Fir-wood, about Forfar, but without fr.; Forest of Bræmar, in fr., *G. Don.* Birch woods, of Bunaw, abundant, *Capt. Carmichael.*

55. H. *molluscum*, stems pectinated, leaves falcato-secund cordate much acuminated serrated not striated faintly 2-nerved at the base, capsule oblong-ovate curved cernuous, lid conical. *Musc. Brit. p.*114.*t.*27. *H. Crista-castrensis, Lightf. p.* 749.

Hab. Woods and rocks, plentiful.

31. BRYUM.

Fruitstalks terminal. *Peristome* double; the *exterior* of 16 teeth; the *interior* of a membrane cut into 16 equal segments, with filiform processes frequently placed between them. *Calyptra* dimidiate. *Musc. Brit. p.* 115. *t.* 3.

Div. I. *Capsules sulcated* (Mnium).

1. Br. *androgynum*, stems nearly simple, leaves lanceolate serrated their margins recurved, capsules nearly erect cylindrical sulcated, lid conical. *Musc. Brit. p.* 115. *t.* 28. *Mnium androg., Lightf. p.* 707.

Hab. Woods and on banks. Appin, *Capt. Carmichael.*

2. Br. *palustre*, stems much branched, leaves lanceolate obtuse entire their margins revolute, capsules ovate oblique sulcated, lid conical. *Musc. Brit. p.* 115. *t.* 28. *Mnium palustre, Lightf. p.* 708.

Hab. Bogs. Pentland hills, &c., *Mr. Greville.* Appin, *Capt. Carmichael.*

Div. II. *Capsules smooth* (*destitute of furrows*).

Sect. I. *Teeth of the external peristome shorter than the inner one* (Meesia).

3. Br. *trichodes*, stems somewhat branched, leaves linear obtuse entire reticulated, capsule ovate recurved subcernuous, fruit-stalk very long. *Musc. Brit. p.* 116. *t.* 28.

Hab. Highland mountains, in wet places. Bogs, &c.

4. Br. *dealbatum*, stems short, leaves lanceolate acute plane serrated at the points reticulated, capsules pyriform nearly erect. *Musc. Brit. p.* 117. *t.* 28.

Hab. Boggy mountains. Near Edinb., &c., *G. Don.* Ben Lawers, *Mr. Winch.* Guillon and Forfar Lochs, *Mr. Arnott.*

Sect. II. *Teeth of the exterior peristome as long as the interior one.*

* *Leaves subulate* (Webera).

5. Br. *pyriforme*, stems slightly branched, leaves subulato-setaceous flexuose serrated, nerve very broad, capsule pyriform pendulous. *Musc. Brit. p.* 118. *t.* 28.

Hab. Rocks, especially of sand or any soft stone. Dry Muir, on the Pentlands; also Ardvoirlich, near Loch Earn, *Mr. Arnott.* Fissures of rocks, Lismore, *Capt. Carmichael.* On the outsides of the garden pots, that are partly plunged in the water, in the hot-houses in the botanic garden at Glasgow; and there bearing fruit.

** *Leaves never subulate.*

† *Leaves without any thickened margin.*

+ *Leaves very obtuse.*

6. Br. *julaceum*, stems branched, leaves closely imbricated broadly ovate concave entire obtuse, nerve running nearly to a point, capsule obovato-cylindraceous, pendulous. *Musc. Brit. p.* 118. *t.* 28.

Hab. Highlands, principally on the elevated mountains.

++ *Leaves acuminate or acute.*

§ *Nerve of the leaf disappearing below the point.*

7. Br. *crudum*, stems simple, leaves rigid lanceolate the upper ones the narrowest and longest, all of them plane serrulate, the nerve disappearing below the summit, capsule oblongo-subpyriform cernuous. *Musc. Brit. p.* 119. *t.* 28. *Mnium crudum, Lightf. p.* 712.

Hab. Banks in mountainous situations, and the crevices of rocks. Craig Lochart, *Mr. Greville.* Mountains of Angus-shire; and on Ben Lawers, *G. Don.* Ben Voirlich, *Mr. Arnott.*

8. Br. *carneum*, stems simple, leaves lanceolate reticulated slightly serrulated at the point, nerve disappearing below the summit, capsule obovate pendulous. *Musc. Brit. p.* 119. *t.* 29.

Hab. Banks. Near Collington, *Mr. Greville.* Angus-shire, frequent, *D. Don.* Ditches, near Arlary, &c., *Mr. Arnott.*

9. Br. *argenteum*, stems branched, leaves closely imbricated broadly ovate suddenly and sharply acuminated subserrulate very concave, nerve disappearing below the point, capsule ovato-pyriform pendulous. *Musc. Brit. p.* 120. *t.* 29. *Lightf. p.* 735.

Hab. On the ground, walls, roofs of houses, &c.

10. Br. *Zierii*, stems branched, leaves closely imbricated more or less broadly ovate acuminulate very concave reticulated entire, nerve running nearly to the point, capsule clavate cernuous. *Musc. Brit. p.* 120. *t.* 29.

Hab. Highland mountains, not uncommon. Habbies' How, &c., *Mr. Greville.* Argyleshire, *Capt. Carmichael.*

§§ *Nerve of the leaf reaching to the point or beyond it.*

11. Br. *roseum*, leaves obovato-spathulate acute serrated undulate, nerve running to the point, capsule oblongo-ovate pendulous. *Musc. Brit. p.* 120. *t.* 29.

Hab. Banks and woods. Braid Hermitage, and Auchindenny woods. Lorn, *Capt. Carmichael.* *Fr.* rare.

12. Br. *capillare*, stems short, leaves obovate twisted when dry mostly entire, their nerve produced into a hair-like point, their margins slightly thickened, capsule oblong pendulous. *Musc. Brit. p.* 121. *t.* 29. *Lightf. p.* 737.

Hab. Heaths, rocks, &c., frequent.

13. Br. *cæspititium*, stems short, leaves ovate acuminated entire or very obscurely serrated at the points, the margins slightly recurved, the nerve reaching to or beyond the point, capsule between ovate and pyriform pendulous. *Musc. Brit. p.* 121. *t.* 29. *Lightf. p.* 736.

α. *major.* *Br. cæspititium, Linn.*

β. *minor.* *Br. bicolor, Dicks.*

Hab. Banks, walls, and roofs, common. β. Argyleshire, &c., *Capt. Carmichael.*

14. Br. *turbinatum*, stems short branched with innovations, leaves ovate acuminated nearly entire, the margins slightly recurved, the nerve running beyond the points, capsule elongato-pyriform pendulous. *Musc. Brit. p.* 122. *t.* 29.

Hab. Wet, sandy, and stony places, chiefly in mountainous situations, common.

15. Br. *nutans*, stems short, leaves erect lanceolate acuminated serrated above, nerve reaching to the point, capsule oblongo-pyriform pendulous. *Musc. Brit. p.* 123. *t.* 29.

Hab. Walls, rocks, and heaths.

16. Br. *elongatum*, stems short, leaves erect elongato-lanceolate acuminated serrated, nerve reaching to the point, capsule elongato-clavate inclined. *Musc. Brit. p.* 123. *t.* 30.

Hab. Mountains. Ben Lawers and Clova, *G. Don.* Hills of Lorn, *Capt. Carmichael.*

17. Br. *alpinum*, stems rigid elongated branched, leaves closely imbricated erect lanceolate somewhat obtuse subserrulate at the apex, margins revolute, nerve reaching to the point, capsules oblongo-ovate pendulous. *Musc. Brit. p.* 124. *t.* 28. *Lightf. p.* 738.

Hab. Rocks in subalpine situations, not uncommon.

18. Br. *ventricosum*, stems elongated branched with innovations, leaves oblong acuminated scarcely serrulated, margins recurved, nerve reaching beyond the point, capsule oblongo-ovate pendulous. *Musc. Brit. p.* 124. *t.* 30. *Mnium triquetrum*, *Lightf. p.* 715.

Hab. Marshy ground and in wet places in the crevices of the rocks.

†† *Leaves with their margins evidently thickened.*

§ *Leaves without denticulations.*

19. Br. *punctatum*, stems elongated, leaves obovato-rotundate very obtuse reticulated their margins thickened entire, nerve disappearing below the point, capsule ovate pendulous, lid shortly rostrate. *Musc. Brit. p.* 125. *t.* 30. *Mnium serpyllifolium* α., *Lightf. p.* 712.

Hab. Marshy places, plentiful.

§ *Leaves denticulated.*

20. Br. *ligulatum*, stems elongated, leaves undulate ligulate reticulated their margins thickened denticulate, nerve reaching a little beyond the point, capsule ovate pendulous, lid conical. *Musc. Brit. p.* 126. *t.* 30. *Mnium serpyllifolium* δ., *Lightf. p.* 715.

Hab. Moist banks and in woods.

21. Br. *rostratum*, stems elongated, leaves broadly ovate reticulated their margins thickened obtuse denticulated, the nerve reaching a little beyond the point, capsule ovate pendulous, lid rostrate. *Musc. Brit. p.* 126. *t.* 30.

Hab. Subalpine situations. Common in the ravines of Lorn, *Capt. Carmichael.*

22. Br. ***marginatum***, stems elongated, leaves ovate acute reticulated their margins thickened serrated, nerve reaching a little beyond the point, capsule ovate pendulous, lid shortly rostrate. *Musc. Brit. p.* 126. *t.* 31.

Hab. Moist and wet places among rocks.

23. Br. ***hornum***, stems elongated, leaves lanceolate acute reticulated, their margins thickened denticulate, nerve generally disappearing below the summit, capsule oblongo-ovate pendulous, lid hemisphærical mucronulate. *Musc. Brit. p.* 127. *t.* 31. *Mnium hornum, Lightf. p.* 711.

Hab. Marshes.

24. Br. ***cuspidatum***, stems elongated, leaves obovate acute reticulated their margins thickened denticulated above, nerve running beyond the point, capsule ovate pendulous, lid conico-hemisphærical obtuse. *Musc. Brit. p.* 127. *t.* 31. *Mnium serpyllifolium* γ., *Lightf. p.* 715.

Hab. Moist shady woods, plentiful.

Order VII. FILICES. *Br. Mirb.*

Fructifications only of one kind on the same individual. *Capsules* spiked or racemed, or mostly collected into *clusters* of various shapes (*sori*) upon the back of the *leaf* or *frond*, naked or covered with an *involucrum*, often surrounded by an elastic *ring* and opening irregularly, or without a *ring* and opening with a regular *fissure*. *Seeds* or *sporules* minute.

There is, usually, a subterraneous horizontal *stem* or *caudex*. *Fronds*, before expansion, circinate; they are simple and entire, or variously divided and branched, and cut into *lobes* and *segments*, or *leaflets* of various forms. *Substance* varying from membranaceous to coriaceous. In the tropics the *caudex* forms a *trunk* resembling that of the palms. In their internal organization the *Ferns* (as well as probably the three following orders) differ remarkably from the rest of the *Acotyledons;* for they have, besides the cellular *structure*, longitudinal *tubes* or *vessels*, as we see in the monocotyledonous *stems*, and these frequently placed in *bundles*.

Div. I. Gyratæ, *Br.* (*Polypodiaceæ*). *Capsules* 1-*celled, furnished with an articulated, elastic, longitudinal* (*generally incomplete*) *ring, transversely and irregularly opening.*

1. GRAMMITIS.

Sori oblong, sublinear, straight, scattered. *Involucre* none.

1. Gr. *Ceterach*, fronds pinnatifid covered with imbricating chaffy scales beneath, segments all coadunate ovate obtuse, scales entire. *Willd.* *Scolopendrium Ceterach, E. B. t.* 1244. *Asplenium Ceterach, Lightf. p.* 661.

Hab. Fissures of rocks. Hill of Kinnoul, Perth, *Lightf.*

2. POLYPODIUM.

Sori (or clusters of fructification) roundish. *Involucre* 0.

* *Fronds pinnatifid.*

1. P. *vulgare*, fronds deeply pinnatifid, the segments linear-lanceolate obtuse crenulate approximate, the superior ones gradually smaller, caudex chaffy. *Lightf. p.* 667. *E. B. t.* 1149.

** *Fronds bipinnatifid.*

2. P. *Phegopteris*, fronds bipinnatifid, the two lowermost pinnæ deflexed, their segments linear lanceolate obtuse entire ciliated, the lowermost ones adnato-decurrent, veins hairy, sori marginal. *Lightf. p.* 669. *E. B. t.* 2224.

Hab. Shady rocky places, in the Lowlands, frequent, *Lightf.*

*** *Fronds thrice compounded.*

3. P. *Dryopteris*, fronds ternate bipinnate patulous and deflexed, the segments obtuse subcrenated, sori marginal, root filiform. *Lightf. p.* 678. *E. B. t.* 616.

Hab. Dry stony places, not uncommon.

3. WOODSIA. *Br.*

Sori scattered, roundish, having beneath an *involucrum* which is cut at the edge into many capillary *segments.*

1. W. *hyperborea*, fronds lanceolate pinnated, pinnæ ovato-cordate inciso-pinnatifid hairy beneath, sori solitary at length confluent. *Br. in Linn. Trans. v.* 11. *t.* 11. *E. B. t.* 2023 (*Polypodium hyperboreum.*). *Acrostichum ilvense, Huds., With.,* (*not of Linn. according to Sm.*)

Hab. Alpine rocks rare. Ben Lawers, *Dickson.* Clova mountains, *G. Don.*

4. ASPIDIUM.

Sori roundish, scattered. *Involucre* umbilicated, or opening on one side. *Willd.*

* *Fronds pinnated.*

1. A. *Lonchitis*, fronds pinnated, pinnæ lanceolato-falcate acute ciliato-serrate, the upper base acutely auricled the lower one cuneate, superior pinnæ bearing the fructifications, stipes chaffy. *E. B. t.* 796, and *Lightf. p.* 669 (*Polypodium Lonchitis*).

Hab. Shady clefts of rocks among the Highland mountains, not uncommon.

** *Fronds subbipinnate, or bipinnatifid.*

† *Involucres dimidiate, reniform.*

2. A. *Oreopteris,* fronds pinnate, pinnæ lanceolate glabrous resinoso-glandulose beneath pinnatifid, the segments lanceolate obtuse entire, lowermost ones longer, sori marginal. *E. B. t.* 1019 (*Polypodium Oreopteris*).

3. A. *Thelypteris,* fronds pinnate, pinnæ linear-lanceolate pinnatifid glabrous, the segments ovate acute entire, sori marginal contiguous at length confluent. *Polypodium Thelypteris, Lightf. p.* 674. *E. B. t.* 509.

HAB. Marshes and bogs, abundant.

4. A. *cristatum,* fronds pinnate, pinnæ subcordate oblong pinnatifid, the segments oblong obtuse dentato-serrate, stipes chaffy. *E. B. t.* 2125. *Hook. in Fl. Lond., with a figure.*

HAB. Native of Scotland, *Smith in E. B.,* under *t.* 1949.

5. A. *aculeatum,* fronds bipinnate, pinnules rigid ovate sublunate acuminate aristate oblique and cuneate at the base and decurrent, the margins faintly serrated spinulose, with a tooth near the base on the upper side, stipes and rachis chaffy. *E. B. t.* 1562 (*margin of the pinnule not good*). *Polypodium aculeatum, Lightf. p.* 675.

HAB. Woods, Rosslyn and Kinross-shire, *Mr. Arnott.* Bute, &c., *Mr. Murray.* Stobhall, &c., *Mr. Young.*

I describe this and the following from English specimens; and cannot be sure that the Scotch are the same. To me they appear decidedly distinct.

6. A. *lobatum,* fronds bipinnate, pinnules scarcely rigid ovate rather obtuse aristate truncate at the base which has a lobe on the upper margin shortly petiolate, the margin deeply serrated and spinulose, stipes and rachis chaffy. *E. B. t.* 1563 (*imperfect specimen*).

HAB. Rosslyn woods, *Maugh.* Appin, *Captain Carmichael.* With *A. aculeat., Mr. Murray* and *Mr. Young.*

This has the broadest frond, far less rigid; and besides the different shape of the *pinnules,* the present species may be recognised by the truly petiolated *pinnules* and their deeply serrated *margins.*

7. A. *Filix mas,* fronds bipinnate, pinnules oblong obtuse serrated, serratures muticous, sori near the central nerve, stipes and rachis chaffy. *E. B. t.* 1458, and 1949 (*Asp. cristatum*). *Polypodium Filix mas, Lightf. p.* 671.

HAB. Woods and shady banks, frequent.

8. A. *dilatatum,* fronds bipinnate, pinnules oblong distinct inciso-pinnatifid, segments mucronato-serrate, stipes chaffy. *E. B. t.* 1461, and *t.* 1460 (*A. spinulosum*). *Polypodium cristatum, Lightf. p.* 670.

HAB. Woods and wet rocky places, frequent.

†† *Involucres lateral.*

9. A. *Filix fœmina,* fronds bipinnate, pinnules oblongo-lanceolate inciso-serrate, serratures bi- or tridentate acute, sori oblong straight. *E. B. t.* 1459. *Polypodium Filix fœmina, Lightf. p.* 673.

Hab. Woods and shady places.

10. A. *fragile,* fronds bipinnate, pinnules oblong obtuse inciso-serrated, serratures obtuse denticulated, their rachis winged. *Willd. Cyathea fragilis, E. B. t.* 1587. *Polypodium fragile, Lightf. p.* 677.

Hab. Rocks and stony places, abundant.

11. A. *dentatum,* fronds pinnate, pinnules ovato-oblong pinnatifid, the segments oblong obtuse toothed. *Willd. Cyathea dentata, E. B. t.* 1588.

Hab. Rocks in the Highlands, *Dickson.* Ben Lawers, *G. Don.*

12. A. *regium,* "frond lanceolate bipinnate pinnatifid, its segments lobed obtuse and beardless, stalk slightly winged, involucre lacerated and turned to one side." *Sm. E. B. t.* 163 (*Cyathea incisa*).

Hab. Ben Lawers, *Maugh.*

This species even Sir James Smith, who first described it in *E. Bot.*, seems disposed to think may be a var. of *A. fragile.*

5. ASPLENIUM.

Sori linear, transverse, scattered. *Involucres* arising from the lateral *veins,* and opening towards the central *nerve* or *rib.*

1. A. *septentrionale,* fronds trifid on a long stipes, segments linear acutely jagged or generally tridentate near the point. *Acrostichum septentrionale, Lightf. p.* 657. *E. B. t.* 1017.

Hab. Clefts of rocks on Arthur's Seat, Edinb., *Lightf.* Rock of Stenton, near Dunkeld, *Mr. Arnott.*

2. A. *marinum,* fronds pinnate, pinnules oblong obtuse inciso-serrate, the superior base rounded and subauriculated, the lower one truncated. *E. B. t.* 392. *Lightf. p.* 664.

Hab. Rocks by the sea-side, especially on the western coast, in many places.

3. A. *Trichomanis,* fronds pinnate, pinnules roundish oblong obtuse crenate, truncato-cuneate at the base (stipes black). *Lightf. p.* 662. *E. B. t.* 576.

Hab. Rocks and walls, common.

4. A. *viride,* fronds pinnated, pinnules roundish ovate obtusely serrate cuneate at the base (stipes green). *Lightf. p.* 663. *E. B. t.* 2257.

Hab. Crevices of the rocks in the mountainous parts of the Highlands. Creg-a-chnocaen, between Ross-shire and Sutherland *Lightf.* Ben Lomond and Ben Nevis, *Mr. Murray.* Ben Lawers *Mr. Winch.* Appin, *Capt. Carmichael.*

5. A. *alternifolium*, fronds pinnate, pinnules alternate lanceolato-cuneate toothed at the apex, lower ones trifid and toothed. *E. B. t.* 2258. *A. germanicum, Willd.* •

Hab. Sunny rocks in the south of Scotland, about two miles from Kelso, on the Tweed, *Dickson.* (In Switzerland it is quite an alpine plant.)

6. A. *Ruta-muraria*, fronds bipinnate at the base, pinnules cuneate obtusely toothed at the extremity. *Lightf. p.* 665. *E. B. t.* 150.

Hab. Walls and the fissures of rocks, frequent.

7. A. *Adiantum nigrum*, fronds bipinnate, pinnæ oblongo-lanceolate acute, pinnules oblong inciso-pinnatifid, the segments toothed at the apex, sori at length confluent. *Lightf. p.* 666. *E. B. t.* 1950.

Hab. Banks in shady places, and fissures of rocks, frequent.

6. SCOLOPENDRIUM.

Sori linear, transverse, scattered. *Involucre* double, occupying both sides of the *sorus*, superficial, and opening as it were by a longitudinal *suture*.

1. S. *vulgare.* E. B. *t.* 1150. *Asplenium Scolopendrium, Lightf. p.* 660.

Hab. Shady, rocky, or stony places.

Frond ligulate, acute, entire, cordate at the base.

7. PTERIS.

Sori continuous, linear, marginal. *Involucre* formed of the inflexed *margin* of the *frond* opening interiorly.

1. Pt. *crispa*, sterile fronds bipinnate, pinnules pinnatifid, the segments obovato-crenate inciso-dentate at the extremity, fertile fronds bipinnate tripinnate below, pinnules linear oblong rather obtuse entire narrow at the base. *E. B. t.* 116. *Osmunda crispa, Lightf. p.* 655.

Hab. Among rocks and stones in the Highland mountains. Ben-na-Caillich in Skye, *Lightf.* Salisbury craigs, *Mr. Stuart.* Birnam hill and near Cluny, *Mr. Arnott.* Goat-fell, in Arran, sparingly; on Ben Nevis, plentifully, *Mr. Murray.* Western Lomond Hill, Fifeshire; and near New Abbey, in Galloway, *Maugh.*

2. Pt. *aquilina*, frond tripartite, branches bipinnate, pinnæ linear-lanceolate, superior undivided, inferior pinnatifid, the segments oblong obtuse[a]. *E. B. t.* 1679. *Lightf. p.* 657.

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[a] I am happy in having the opportunity of publishing here some remarks upon the structure of the fructification of this plant, which have been kindly communicated to me in a letter from Thomas Smith, Esq. of the Temple, London. They allude to a real *involucrum* distinct from that formed by the involution of the margin of the *frond.* "This," Mr. Smith says, "will be found exactly opposite to that which is seen on the edge of the *frond*, and,

Hab. Woods, heaths, and rough stony soils, abundant.

Used as litter for cattle, and very frequently for the purpose of thatching cottages. The ashes are employed in the manufactories of soap and glass. Its astringent quality has recommended it in the dressing and preparing kid and chamois leather; the country people take it medicinally, to destroy worms, and a bed made of the green plant is esteemed a sovereign cure for the rickets in children, *Lightf.*

8. BLECHNUM.

Sori linear, longitudinal, continuous, parallel on each side of the rib of the frond. *Involucre* superficial, continuous, opening interiorly.

1. Bl. *boreale*, sterile fronds pinnatifid, the segments lanceolate rather obtuse parallel, fructiferous fronds pinnate, pinnæ linear acuminate. *E. B. t.* 1159. *Osmunda spicant, Lightf. p.* 654.

Hab. Woods, heaths, among rocks, &c., plentiful.

9. ADIANTUM.

Sori oblong or roundish. *Involucres* membranaceous, arising from distinct portions of the margin of the frond turned in, opening interiorly.

1. A. *Capillus Veneris*, frond bipinnate, pinnules obovato-cuneate inciso-sublobate, segments of the fertile pinnules terminated by a linear-oblong sorus, sterile ones serrated. *E. B. t.* 1564.

Hab. Banks of the Carron, a rivulet in Kincardineshire, *Prof. Beattie.*

10. HYMENOPHYLLUM.

Sori marginal. *Capsules* sessile, inserted upon a common cylindrical receptacle, within a 2-valved *involucre* of the same texture as the frond; *valves* plane, *exterior* one free. *Br.*

1. H. *tunbridgense*, fronds bipinnatifid glabrous, the segments

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between the two, the line of *capsules* is placed. It may be called the inner *involucre*, and much resembles the outer, having, like that, a ciliated edge; but instead of being flat it curls inwards, covering the *capsules* in their young state, and being itself covered by the outer one. It is best perhaps seen when the *capsules* are about half ripe: at which time it is nearly of the same breadth as the outer one, and is readily seen by the assistance of the microscope. In texture it seems to differ a little from the outer."

"According to the principles upon which genera are formed in this order, the inner *involucrum* seems to afford a character which would justify the forming a new genus. I have found it in *Pteris caudata*, which is very nearly allied to *aqualina*: it also occurs in *Pt. esculenta*: and our mutual friend Brown authorizes me to say that it is found in a small group of the genus *Pteris*, the species of which agree in habit and are mostly extratropical, differing from the tropical species in having a thicker and harder *frond*, and not a thin filmy one which is found in most of the latter. It is perhaps not unworthy of remark, that this *involucrum* is never found, except when there is fructification. The outer one, it is well known, is almost always present whether there is fructification or not,—a circumstance, I believe, which does not generally take place in a true *Involucrum*." *Smith in Letter, Aug.* 1819.

linear undivided or bifid, and, as well as the extremity of the axillary involucre, spinuloso-dentate. *Br. E. B. t.* 162. *Hook. in Fl. Lond. with a figure. Trichomanes tunbridgense, Lightf. p.* 681.

Hab. Wet rocks in the Highlands, abundant. In the greatest profusion on rocks near the road side along the shores of Loch Lomond.

Div. II. Osmundaceæ. *Capsules destitute of a ring, vasculoso-reticulate, pellucid, at the top, radiated or substriated, and hence longitudinally (and often externally) opening. Br.*

11. OSMUNDA.

Capsules subglobose, pedicellate, striated, half-bivalved, paniculated. *Involucre* none.

1. O. *regalis*, fronds bipinnate, pinnules lanceolate nearly entire the lower base somewhat auricled, the inferior ones opposite, fructifying panicle bipinnate at the extremity of the frond. *Willd. E. B. t.* 209. *Lightf. p.* 653.

Hab. Boggy places, especially near water; at the margins of lakes, not unfrequent.

2—3 feet high. The largest and handsomest of the British Ferns.

Div. III. Ophioglosseæ. *Capsules of one cell, adnate at the base, subglobose, coriaceous, opaque, destitute of a ring, not cellular (sometimes connate), semi-bivalved.*

12. OPHIOGLOSSUM.

Capsules naked upon an articulated distichous spike, connate, one-celled, transversely opening, two-valved. *Willd.*

1. O. *vulgatum*, spike cauline, frond ovate obtuse. *E. B. t.* 108. *Lightf. p.* 651. *Hook. in E. B. with a figure.*

Hab. Meadows and moist pastures, but not very common, as about Dunsinnane hill; in Gowrie, &c. *Lightf.* Woodhall, by Glasgow, *Hopk.* Old lee pasture at Possil, near the porter's lodge, Glasgow, *Mr. Murray.* Den of Rechip, *Mr. Arnott.* Appin, *Capt. Carmichael.*

13. BOTRYCHIUM.

Capsules subglobose, adnate with the racemed, compound rachis, distinct, naked, one-celled, valves two, connected behind, transversely opening. *Willd.*

1. Br. *Lunaria*, scape with a single frond above, frond pinnated, pinnæ lunate entire. *Willd. Hook. in Fl. Lond. with a figure. Osmunda Lunaria, Lightf. p.* 652. *E. B. t.* 318.

Hab. Mountain pasture. North of Linlithgow, *Sibbald.* West coast of Ross-shire and in Skye, *Lightf.* Pentland hills, Caroline Park, Cluny, &c. *Mr. Arnott.* Near Largs, Bute, Arran, and banks of the Clyde below Greenock, &c. *Mr. Murray.* Appin, *Capt. Carmichael.*

In some specimens gathered by Capt. Carmichael there were capsules produced round the lower segments of the fronds.

ORDER VIII.—LYCOPODINEÆ. *Sw.*

Fructification bracteated, axillary, or spiked. *Capsules* frequently of two kinds on the same plant, 1—3-celled, 2—3-valved, containing many minute *granules*; or a few, larger *corpuscules*. —*Roots* fibrous. *Stems* herbaceous or woody, simple or branched, often creeping. *Leaves* small, undivided, numerous, scattered, or alternate and distichous, often stipulated. *Mirb.*

14. LYCOPODIUM.

Capsules one-celled, axillary, sessile; some of them two-valved, filled with a farinaceous substance; others 3-valved, containing from 1—6 globose corpuscules. *Br.*

1. L. *clavatum*, stem creeping, branches ascending, leaves scattered incurved and hair-pointed, spikes geminate cylindrical pedunculate their scales ovate acuminate eroso-dentate. *Lightf. p.* 685. *E. B. t.* 224.

HAB. Mountainous and heathy pastures, plentiful.

The *seeds* are used to produce artificial lightning on the stage; and the Poles make a decoction of the plant to cure persons afflicted with that terrible disease, the *Plica polonica.*

2. L. *alpinum*, stems prostrate, branches dichotomous and fasciculated, leaves quadrifarious oblong convex acute appressed, spikes terminal solitary sessile short cylindrical. *Lightf. p.* 690. *E. B. t.* 234.

HAB. Upon the lofty Highland mountains, plentiful.

3. L. *annotinum*, stem creeping, branches ascending dichotomously branched, branchlets simple, leaves in 5 rows linear-lanceolate mucronate serrulate patent, spikes oblongo-cylindrical solitary sessile terminal. *Lightf. p.* 689. *E. B. t.* 1727.

HAB. Rough stony places by the sides of the Highland mountains, but not common, *Lightf.* Summit of Cairn-gorum, *Hook.*

4. L. *inundatum*, stem creeping, branches simple solitary erect with a single sessile leafy spike at its extremity, leaves linear scattered acute entire curved upwards. *Lightf. p.* 687. *E. B. t.* 239.

HAB. Wet heathy places and by the sides of lakes, but not common. About Blair in Athol, *Dr. Parsons.*

5. L. *selaginoides*, stem creeping, branches ascending simple, leaves scattered lanceolate subpatent ciliato-denticulate, spikes terminal solitary. *Lightf. p.* 686. *E. B. t.* 1148.

HAB. Boggy places by the sides of rivulets on the Highland mountains, frequent.

6. L. *Selago*, stems dichotomously branched erect fastigiate, leaves scattered in 8 rows linear-lanceolate acuminate entire imbricated rigid, capsules scattered (not spiked). *Lightf. p.* 687. *E. B. t.* 233.

Hab. Highland mountains, frequent.

Used in Raasay, near Skye, and some other places, instead of alum, to fix the colours in dyeing. The Highlanders employ it, in infusion, as an emetic and cathartic; but it operates violently, and, unless taken in a small dose, brings on giddiness and convulsions, *Lightf.*

Linnæus says, that the Swedes use a decoction of it to destroy lice on swine and other animals.

Order IX. MARSILEACEÆ. *Br.*

Fructifications radical. *Involucrum* subsphærical, not opening, coriaceous or membranaceous, one- or many-celled. Aquatics.

1. ISOETES.

Capsule membranaceous, not opening, immersed in the base of the frond, one-celled. *Seeds* angular, inserted upon many filiform receptacles.

1. I. *lacustris*, *Lightf. p.*683. *E. B. t.*1084.

Hab. Bottoms of the Highland lakes, not uncommon. In Jura and Skye, *Lightf.* Loch Tay, *Dr. Stuart.* Loch of Clunie, *Rev. Mr. M'Ritchie.* Loch Lomond, *Mr. Murray.* Loch Leven, *Mr. Arnott.* Shallow parts of the Lake of Monteith, *Mr. Young.*

Leaves all radical, 5—6 inches long, subulate, semicylindrical, fleshy.

2. PILULARIA.

Involucres imbricated, solitary, nearly sessile, globose, coriaceous, 4-celled. *Cells* containing two different kinds of bodies, *anthers?* and *capsules?*

1. P. *globulifera*, *Lightf. p.* 683. *E. B. t.* 521. *Hook. in Fl. Lond. with a figure.*

Hab. Damp places that are overflowed during the winter, but not common. Braid hill marshes, Pentland hills; Cuthel muir, &c. *Mr. Arnott.* Loch of Cluny, *Rev. Mr. M'Ritchie.* Loch Lomond, *Mr. Murray.*

Stems filiform, creeping. *Leaves* 2—3 inches long subulato-filiform, clustered. *Involucres* as large as peas, brown, scaly at the base of the leaves.

Order X. EQUISETACEÆ.

Fructification terminal, spicate, consisting of peltate polygonous scales, on the under side of which are from 4—7 involucres, which open longitudinally, and contain numerous naked (?) seeds, enfolded by four filaments bearing anthers (?) at their extremities.

Vegetation: stems rigid, leafless, jointed, striated, the articulations sheathed at the base, the branches whorled.

1. EQUISETUM.

1. E. *arvense*, sterile stems decumbent with simple branches,

which are roughish tetragonal, fertile ones erect simple their sheaths cylindrical inciso-dentate. *Lightf. p.* 647. *E. B. t.* 2020.

Hab. Wet meadows and corn-fields, frequent, flowering early in May. Considered very prejudicial to land, and injurious to cattle which occasionally eat it.

2. E. *fluviatile*, sterile stems with very numerous simple branches which are roughish octagonal, fertile ones simple, the sheaths infundibuliform lacerato-dentate, their teeth setaceous. *Lightf. p.* 649. *E. B. t.* 2022.

Hab. Shady marshes and the brinks of stagnant waters; flowering May, June. Three feet, or more, high, the stems very broad, the branches most numerous and erecto-patent.

3. E. *sylvaticum*, sterile and fertile stems with their branches compound roughish deflexed four-sided, branchlets subtriquetrous. *Lightf. p.* 646. *E. B. t.* 1874.

Hab. Woods, hedge-banks, and moist shady places.

4. E. *limosum*, stems branched upwards, with the branches about 12 in a whorl simple pentagonous smooth, spike or catkin terminal. *Lightf. p.* 648.

Hab. Lakes and ditches, frequent.

5. E. *palustre*, stems branched glabrous sulcate, branches simple pentagonous, spike terminal. *Lightf. p.* 648. *E. B. t.* 2021.

Hab. Ditches and wet soils, frequent.

6. E. *variegatum*, stems naked very rough branched at the base, sheaths black with white membranous lanceolate teeth, spike terminal. *E. B. t.* 1987.

Hab. Sands of Barry, in Angus-shire, *G. Don*.

7. E. *hyemale*, stems simple erect very rough bearing spikes at the extremity, sheaths whitish black at the base and summits, teeth aristate deciduous. *Lightf. p.* 650. *E. B. t.* 915.

All the *Equiseta* or *Horse-tails* are very rough to the touch; their bark abounds in silex, and they are thus admirably suited to the polishing of hard woods, ivory, brass, &c. This is, however, by far the most preferable kind, and is imported largely from Holland for that purpose, under the name of *Dutch rushes*. In Northumberland, Lightfoot tells us, the dairy-maids employ it to scour and clean their milk-pails.

CLASS II. MONOCOTYLEDONS. *Juss.*

(*Endorhizæ Rich. Monocotyledoneæ or Endogeneæ Decand.*)

Fruct. Embryo with one *Cotyledon;* or, if with two, then the additional *cotyledon* is smaller and alternate with the larger. *Plumule* usually inclosed in the body of the *Embryo*, which it perforates laterally as soon as germination commences, and generally considerably elongated before the *radicles* are protruded. The inferior end of the *Embryo* pierced by the radicles, which were inclosed in its substance, and remaining under the form of a *rim* or short *sheath* surrounding the base.

Vegetation. *Stem* cylindrical, increasing by addition to its centre with no perceptible difference of structure between the bark and the wood. *Leaves* alternate, often sheathing; with close parallel nerves, and minute transverse veins.

ORDER I. GRAMINEÆ. *Juss.*

Glume (*calyx Linn.*) 1—2- or many-flowered, mostly of 2 valves, rarely of 1 or wanting. *Perianth* (*corolla Linn.*) glumaceous, 1—2-valved. *Stamens* hypogynous. *Anthers* versatile. *Ovary* superior, with one *ovule*. *Styles* 2, rarely 1 or 3. *Stigmas* plumose. *Pericarp* a *Caryopsis*, or *Utriculus*. *Embryo* scutelliform, lateral, on the outside of the base of a farinaceous copious *albumen*. *Plumule* naked. *Stems* fistulose, generally simple and herbaceous, sometimes branched, rarely shrubby. *Leaves* one to each joint, with a *sheath* slit longitudinally on one side, having a membranous appendage (*ligule*) at its summit. *Flowers* small, panicled or spiked. *Br.*

SECT. I. PANICEÆ. *Br. in Flind. Voy. Glume with* 2—3 *flowers, of which the lowest is imperfect. Br.*

1. PANICUM.

Cal. of two valves, 2-flowered; the inferior *valve* very small. *Flowers* dissimilar; the *inferior* imperfect, of one or two valves; the *superior* perfect, 2-valved; *seed* invested with the permanent hardened *perianth*.

1. P. *sanguinale*, spike digitate, florets in pairs secund pubescent at the margins, leaves and sheaths slightly hairy. *p.* 21[a]. *Pastures, rare.*

2. ANTHOXANTHUM.

Glume of 2 valves, 3-flowered. *Inferior* flowers imperfect, of one valve, awned; *superior floret* 2-valved, perfect, awnless, *valves* minute. *Stam.* 2. *Caryopsis* free[b].

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[a] The pages thus referred to, after each specific character, throughout the *mono-* and *dicotyledonous* plants, are in the *first Part* of this *Flora*, where fuller descriptions and more particular habitats are given: both of which it was deemed unnecessary to repeat here.

[b] The character of this genus is so different from that which we have given of it in the first part of this work, that it will be unintelligible to students without some further explanation. It is therefore to be observed, that what are here termed the two lower imperfect florets, are in our character at p. 3, called the two outer valves of a double *perianth*, in conformity to the general mode of describing it, adopted by botanists of the Linnæan school.

1. A. *odoratum*, panicle spiked oblong, flowers upon short footstalks larger than the awns. *p.* 11.—*Pastures.*

3. HIEROCHLOE.

Glume of 2 valves, 3-flowered. *Perianth* of 2 valves; the lateral florets staminiferous, triandrous; terminal one perfect, diandrous. *Br.*

1. H. *borealis*, panicle subsecund, peduncles glabrous, florets awnless, outer valves of the perianth ciliated at the margin. *p.* 28. *Mountains, rare.*

SECT. II. POACEÆ. *Brown in Flind. Voy.* *Glumes* with one, two, or many flowers; either all perfect, or with the upper flower abortive. *Br.*

A. *Glume 1-flowered.*

4. NARDUS.

Glume none. *Perianth* of two valves. *Style* 1.

1. N. *stricta*, spike erect slender, the florets all pointing one way. *p.* 21.—*Heaths.*

5. ALOPECURUS.

Glume 2-valved, 1-flowered; *valves* nearly equal, united at the base, acute. *Perianth* of one valve, awned at the base.

1. A. *pratensis*, culm erect smooth, panicle spiked cylindrical obtuse, valves of the glume lanceolate acute hairy connate at the base, awn twice the length of the perianth. *p.* 22.—*Pastures.*
2. A. *alpinus*, culm erect smooth, panicle in an ovate spike, valves of the glume ovate abruptly acute hairy united at their base, awn scarcely longer than the perianth. *p.* 22.—*Alps.*
3. A. *agrestis*, culm erect scabrous above, panicle spiked cylindrical acuminate, valves of the glume acute almost glabrous united as far as the middle. *p.* 22.—*Fields.*
4. A. *geniculatus*, culm ascending bent at the joints, panicle spiked cylindrical obtuse, valves of the glumes united at the base truncated slightly hairy, awn twice as long as the perianth. *p.* 22. *Meadows.*

6. PHALARIS.

Glume 2-valved, 1-flowered; *flowers* with a double *perianth.* *Caryopsis* invested with the inner hardened perianth.

1. Ph. *canariensis*, panicle spiked ovate, valves of the glumes boat-shaped entire at the point, ext. perianth of 2-valves. *p.* 23. *Fields.*
2. Ph. *arundinacea*, panicle erect, branches patent, florets clustered secund, ext. perianth of two very minute hairy valves. *p.* 23.—*Margins of rivers, &c.*

7. PHLEUM.

Glume 2-valved, 1-flowered; *valves* nearly equal, acuminate or mucronato-aristate, including a single awnless perianth. *Caryopsis* free.

1. Phl. *pratense*, spike cylindrical, glumes truncate mucronato-aristate ciliated at the back longer than the awn. *p.* 23.—*Pastures.*
2. Phl. *alpinum*, spike ovato-oblong, glumes truncate mucronato-aristate ciliated at the back equal in length to the awn, *p.* 23. *Alps.*
3. Phl. *Michelii*, panicle spiked cylindrical, glumes lanceolate acuminate strongly ciliated at the back. *p.* 24.—*Alps.*
4. Phl. *arenarium*, panicle spiked oblongo-obovate, glumes lanceolate acute ciliated at the back. *p.* 24.—*Sandy sea-shores.*

8. MILIUM.

Glume 2-valved, 1-flowered; *valves* ventricose. *Caryopsis* invested with the permanent, hardened *perianth.*

1. M. *effusum*, flowers loosely panicled awnless. *p.* 24.—*Woods.*

9. AGROSTIS.

Glume 2-valved, 1-flowered; *valves* acute, compressed, awnless. *Perianth* shorter than the glume, slightly hairy at the base. *Caryopsis* free.

* *Outer valve of the Perianth awned.*

1. A. *canina*, branches of the panicle long slender erecto-patent, valves of the glume unequal lanceolate rough at the back, perianth of 1 valve with a dorsal awn from below the middle, leaves linear. *p.* 24.—*Heaths, &c.*
2. A. *setacea*, branches of the panicle short erect, valves of the glumes unequal lanceolate rough at the back, outer valve of the perianth with a longish awn from the base, inner one ovate very minute, leaves setaceous. *p.* 25.—*Heaths?*

** *Perianth awnless* (*or mostly so*).

3. A. *vulgaris*, branches of the panicle smoothish, branchlets diverging, outer valve of the perianth 3-nerved, ligule extremely short and truncate. *p.* 25.—*Pastures, &c.*
4. A. *alba*, branches of the panicle hispid, branchlets patent, outer valve of the perianth 5-nerved, ligule long. *p.* 25.—*Waste places.*

10. ARUNDO.

Glume of 2-valves, 1-flowered (in *A. Phragmites* many-fl.). *Perianth* surrounded with long hairs. *Caryopsis* free, but covered with the *perianth.*

* *Glume* 1-*flowered* (Calamagrostis).

† *Perianth awned.*

1. A. *Calamagrostis*, panicle erect diffuse, glumes acuminate, perianth with a small terminal awn shorter than the glume and the tuft of hairs. *p.* 27.—*Shady places.*
2. A. *stricta*, panicle erect close, glumes acute, perianth about as long as the glume longer than the tuft of hairs with a dorsal awn equal to it in length. *p.* 27.—*Marshes, rare.*

†† *Perianth awnless.*

3. A. *arenaria*, panicle spiked, glumes acute, perianth as long as the glume thrice as long as the tuft of hairs, leaves involute pungent. *p.* 27.—*Sandy sea-shores.*

** *Glume many-flowered* (Arundo).

4. A. *Phragmites*, glume about 5-flowered, florets longer than the glume. *p.* 27.—*Watery places.*

11. ROTTBOLLIA.

Glume of 2 valves, 1-flowered, *valves* lateral. *Flowers* alternate, ranged upon a jointed rachis.

1. R. *incurvata*, spike filiform or awl-shaped, glume 2-valved. *p.* 46.—*Sandy sea-shores.*

12. HORDEUM.

Glumes standing three together, 2-valved, 1-flowered; *valves* lateral; intermediate glumes perfect, lateral ones with anthers or pistils. *Perianth* 2-valved, awned.

1. H. *murinum*, valves of the glumes of the intermediate floret linear-lanceolate ciliated, those of the lateral florets setaceous scabrous. *p.* 46.—*Waysides.*
2. H. *pratense*, valves of the glumes all setaceous scabrous. *p.* 46. —*Pastures, rare.*
3. H. *maritimum*, valves of the glumes smoothish, the int. one of the lateral florets semi-lanceolate, the rest setaceous. *p.* 46. —*Sea-coast, rare.*

B. *Glume* 2-, *rarely* 3-*flowered.*

13. HOLCUS[a].

Glume 2-valved, 2-flowered, nearly equal. *Perianth* 2-valved. *Florets* dissimilar, polygamous, one awned, the other awnless, without any imperfect one between them. *Caryopsis* free or enveloped in the membranaceous *perianth.*

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[a] *Holcus* thus characterised is very different from the *Holcus* of Mr. Brown, and most of the Linnæan species, which constitute the genus *Sorghum* of Persoon, and do not belong even to this section, but to *Paniceæ.*

1. H. *avenaceus*, perfect floret superior scarcely awned, imperfect one antheriferous with a very long jointed awn, root knotted. *p.* 28.—*Pastures.*
2. H. *mollis*, perfect floret inferior and awnless, imperfect one antheriferous with a bent awn reaching beyond the glume, root creeping. *p.* 28.—*Hedges and pastures.*
3. H. *lanatus*, perfect floret inferior and awnless, imperfect one antheriferous with a curved awn included in the glume, root fibrous. *p.* 28.—*Pastures.*

14. AIRA.

Glume 2-valved, unequal, 2-flowered. *Perianth* 2-valved, the outer one awned above the base (rarely awnless). *Florets* without any imperfect ones between them. *Caryopsis* free, but covered with the perianth.

* *Perianth awnless.*

1. A. *cristata*, panicle spiked, florets longer than the acuminated glumes, leaves hairy, *p.* 29.—*Dry pastures, near the sea.*
2. A. *aquatica*, panicle spreading, glumes obtuse, florets longer than the glumes. *p.* 29.—*Watery places.*

** *Perianth awned.*

3. A. *cæspitosa*, panicle diffuse, branches scabrous, florets villous at the base rather longer than the glume, awn straight inserted near the base of and not exceeding the perianth, leaves plane. *p.* 29.—*Shady places.*
4. A. *alpina*, panicle subcoarctate, branches and pedicels perfectly smooth, florets villous at the base as long as the glume, awn inserted above the middle of and scarcely exceeding the perianth, leaves linear. *p.* 30.—*Alps.*
5. A. *flexuosa*, panicle (when flowering) diffuse, florets villous at the base as long as the glume, awn jointed inserted near the base much longer than the perianth, leaves setaceous. *p.* 30. —*Heaths.*
6. A. *caryophyllea*, panicle divaricate, florets scarcely villous at the base shorter than the glume, awn inserted below the middle jointed longer than the glume, leaves setaceous. *p.* 30.—*Dry pastures.*
7. A. *præcox*, panicle somewhat spiked, florets scarcely villous at the base about as long as the glume, awn twisted inserted below the middle longer than the glume, leaves setaceous. *p.* 30. —*Sandy pastures.*

15. MELICA.

Glume 2-valved, about 2-flowered, with the rudiment of a third *floret.* *Perianth* 2-valved, awnless. *Caryopsis* free, covered by the cartilaginous *perianth.*

1. M. *nutans,* panicle nearly simple racemed secund, spikelets drooping ovate 2-flowered. *p.* 30.—*Woods.*
2. M. *uniflora,* panicled branched slightly drooping, spikelets erect ovate with only one perfect floret. *p.* 31.—*Woods.*
3. M. *cærulea,* panicle erect subcoarctate, spikelets erect oblongo-cylindrical. *p.* 31.—*Moors.*

C. *Glume many-flowered.*

16. LOLIUM.

Glume of 1 valve, lateral, fixed. *Perianth* 2-valved, firmly enveloping the *Caryopsis* ; *valves* lanceolate, ext. with or without an awn inserted below the extremity.

1. L. *perenne,* spikelets much longer than the glume, florets awnless linear-oblong compressed, root perennial. *p.* 45.—*Waste places.*
2. L. *arvense,* spikelets about as long as the glume, florets elliptical with very soft short awns, root annual. *p.* 45.—*Fields.*
3. L. *temulentum,* spikelets shorter than the glume, florets elliptical about as long as the rigid awn, root annual. *p.* 45.—*Fields.*

17. SESLERIA.

Glume 2—3-flowered, compressed, acute, somewhat awned. *Perianth* variously toothed or awned. *Caryopsis* free, but covered with the *perianth.*

1. S. *cærulea,* panicle spiked ovate bracteated, spikelets 2—3-flowered, ext. valve of the perianth aristate and toothed. *p.* 31.—*Mountains.*

18. POA.

Glume 2-valved, many-flowered; *valves* of the *perianth* subovate, somewhat acute, awnless. *Caryopsis* free, covered with the *perianth.*

1. P. *aquatica,* panicle erect very much branched, spikelets linear of obout 6 obtuse florets which have 7 ribs. *p.* 32.—*Ditches, &c.*
2. P. *fluitans,* panicle nearly erect slightly branched, spikelets linear appressed of from 7—11 obtuse florets which have 7 ribs with short intermediate ribs at the base, root creeping. *p.* 32.—*Ditches.*
3. P. *maritima,* panicle erect subcoarctate (rigid), spikelets linear of about 5 obtuse flowers which are obsoletely 5-nerved, leaves convolute, root creeping. *p.* 33.—*Sea-coast.*
4. P. *distans,* panicle divaricate, branches at length deflexed, spikelets linear of about 5 obtuse flowers which are obsoletely 5-nerved, leaves plane, root fibrous. *p.* 33.—*Pastures near the coast.*

5. P. *procumbens*, panicle compact ovato-lanceolate disticho-secund (rigid), spikelets linear-lanceolate of about 4 flowers which are 5-ribbed. *p.* 33.—*Salt marshes.*

6. P. *rigida*, panicle lanceolate disticho-secund (rigid), spikelets linear acute of about 7 flowers which are almost ribless, root fibrous. *p.* 33.—*Walls and dry banks.*

7. P. *compressa*, panicle subsecund spreading (afterwards subcoarctate), spikelets oblongo-ovate of from 5—7 obtuse flowers connected by a web, culm compressed, root creeping. *p.* 34. —*Walls.*

8. P. *alpina*, panicle diffuse, spikelets ovate of 4—5 acute flowers hairy below (but not webbed), leaves broadly linear obtuse, ligule of the upper leaves oblong acute, of the lower ones short obtuse. *p.* 34.—*Alps.*

9. P. *laxa*, panicle contracted lax slightly drooping, spikelets ovate of about 3 flowers which are acute connected by a web, leaves linear acute narrow, ligules all lanceolate. *p.* 34.—*Alps.*

10. P. *cæsia*, " panicle spreading, spikelets ovate 5-flowered, glumes lanceolate silky-edged unconnected by any web, ligule very short and blunt." *p.* 34.—*Alps.*

11. P. *trivialis*, panicle diffuse, spikelets oblongo-ovate of about 3 flowers which are acute 5-nerved connected with a web, culms and sheath roughish, ligule oblong, root fibrous. *p.* 35. —*Meadows.*

12. P. *pratensis*, panicle diffuse, spikelets oblongo-ovate of about 4 flowers which are acute 5-nerved webbed, culm and sheaths smooth, ligule short, root creeping. *p.* 35.—*Meadows.*

13. P. *annua*, panicle subsecund divaricated, spikelets oblongo-ovate of about 5 flowers which are a little remote 5-ribbed destitute of web, culm ascending compressed, root fibrous. *p.* 35.—*Pastures.*

14. P. *nemoralis*, panicle slender slightly leaning one way lax attenuate, spikelets lanceolate of about 3 rather distant slightly webbed flowers, ligule short truncate, culms subcompressed and sheaths glabrous, root subrepent. *p.* 35.—*Woods and mountains.*

15. P. *decumbens*, panicle nearly simple contracted few-flowered, glume as long as the four-flowered spikelet, ligule a tuft of hairs. *p.* 36.—*Mountain pastures.*

19. BRIZA.

Glume 2-valved, many-flowered. *Perianth* 2-valved, ventricose, the *valves* cordate, obtuse, awnless. *Caryopsis* adnate with the *perianth.*

1. Br. *media*, spikelets broadly ovate of about 7 flowers, glume shorter than the florets. *p.* 37.—*Pastures.*

20. DACTYLIS.

Glume 2-valved, many-flowered; valves unequal, the larger one keeled. *Perianth* 2-valved; *valves* lanceolate, awnless. *Caryopsis* invested with the permanent, hardened *perianth.*

1. D. *glomerata,* panicle crowded secund, leaves plane. *p.* 37. — *Way-sides, &c.*

21. ELYMUS.

Glumes many-flowered, in pairs or ternate, lateral, the *valves* nearly equal. *Perianth* firmly enveloping the *caryopsis; valves* lanceolate, ext. acuminate or lengthened into an awn. (*Fl. spiked.*)

1. E. *arenarius,* spike upright dense, spikelets pubescent, flowers awnless as long as the glume, leaves involute rigid. *p.* 46.—*Sandy sea-shores.*

22. FESTUCA.

Glume 2-valved, many-flowered; *valves* unequal. *Perianth* of 2 valves, lanceolate, ext. one acuminate or awned at the extremity.

1. F. *ovina,* panicle subsecund subcoarctate, spikelets oblong of about 4—5 flowers with short awns, culms square (upward), leaves setaceous. *p.* 38.—*Dry pastures.*
2. F. *duriuscula,* panicle subsecund subcoarctate, spikelets oblong of about 6 flowers with short awns, stem leaves nearly plane, radical ones subsetaceous. *p.* 38.—*Dry pastures, especially near the sea.*
3. F. *bromoides,* panicle secund racemose, flowers shorter than the awn monandrous, culm above leafless. *p.* 39.—*Walls.*
4. F. *Myurus,* panicle secund elongate contracted, flowers shorter than the awn monandrous, culm leafy in its upper part. *p.* 39. —*Walls, &c.*
5. F. *gigantea,* panicle branched drooping towards one side, spikelets lanceolate compressed, flowers shorter than the awn, leaves linear-lanceolate ribbed. *p.* 39.—*Moist woods.*
6. F. *calamaria,* panicle subsecund much branched spreading nearly erect, spikelets oblong awnless 3—5-flowered, leaves linear-lanceolate. *p.* 40.—*Moist alpine woods.*
7. F. *foliacea,* raceme spiked distichous elongate, spikelets distant linear many-flowered, florets cylindrical awnless. *p.* 40. —*Pastures.*
8. F. *pratensis,* panicle patent branched, spikelets linear many-flowered, florets cylindrical awnless, leaves linear, root fibrous. *p.* 40.—*Meadows.*
9. F. *elatior,* panicle patent very much branched, spikelets ovato-lanceolate many-flowered, florets cylindrical subaristate,

leaves linear-lanceolate, root creeping. *p.* 40.—*Moist pastures.*

23. TRITICUM.

Glumes 2-valved, many-flowered; *valves* opposite, solitary, nearly equal. *Perianth* 2-valved; *valves* lanceolate; ext. one acuminated or lengthened into an awn. *Caryopsis* adnate with the *perianth.* *Rachis* zigzag, toothed. (*Flowers spiked.*)

1. Tr. *junceum,* valves of the glume obtuse much ribbed with 4—5 awnless flowers, leaves involute pungent, root creeping. *p.* 44.—*Sea-coast.*
2. Tr. *repens,* valves of the glume much nerved with from 4—8 awned (rarely awnless) flowers, leaves plane, root creeping. *p.* 44.—*Waste places.*
3. Tr. *caninum,* valves of the glume awned (mostly 3-) nerved with about 5 awned flowers, leaves plane, root fibrous. *p.* 44. —*Woods and banks.*
4. Tr. *cristatum,* valves of the glume subulate keeled aristate scarcely nerved of about 4 awned flowers, spikelets much crowded. *p.* 45.—*Sea-side, very rare.*
5. Tr. *loliaceum,* spike secund, valves of the glume indistinctly 3-nerved obtuse of many awnless flowers, root fibrous annual. *p.* 45.—*Sea-coast.*

24. BROMUS.

Glume of 2 valves, many-flowered. *Perianth* bivalved; *valves* lanceolate; ext. one awned below the extremity. *Caryopsis* adnate with the *perianth.* (Inner *valve* fringed. *Sm.*)

* *Awn terminal. Raceme spiked.*

1. Br. *sylvaticus,* raceme spiked slightly drooping, spikelets distichous linear erect remote, awns straight longer than the florets. *p.* 40.—*Woods.*

** *Awns from below the point of the perianth. Panicle branched.*

2. Br. *secalinus,* panicle spreading, peduncles but little branched, spikelets oblongo-ovate (ovate, *Sm.*) compressed of about 10 subcylindrical glabrous rather remote flowers longer than the awn. *p.* 41.—*Fields.*
3. Br. *velutinus,* panicle spreading, peduncles but little branched, spikelets oblongo-lanceolate compressed of about 12 cylindrical pubescent subimbricated florets, awns longer than the glume (at length patent). *p.* 41.—*Fields.*
4. Br. *mollis,* panicle erect close compound, spikelets ovate subcompressed, florets imbricated depressed pubescent, awn straight about as long as the glume, leaves very soft pubescent. *p.* 41.—*Pastures.*
5. Br. *racemosus,* panicle erect, peduncles simple, spikelets ovate

subcompressed glabrous, florets imbricated depressed, awns straight about as long as the glume, leaves slightly hairy. *p.* 41.—*Fields.*

6. Br. *squarrosus,* panicle drooping, peduncles simple, spikelets ovato-lanceolate subcompressed, florets nearly glabrous imbricated depressed, awn divaricating, leaves pubescent. *p.* 42.—*Fields ?*
7. Br. *arvensis,* panicle spreading (at length drooping) peduncles branched, spikelets lanceolate compressed, florets imbricated depressed glabrous about as long as the straight awn, leaves hairy. *p.* 42.—*Fields.*
8. Br. *erectus,* panicle erect, spikelets linear-lanceolate compressed, florets subcylindrical remote glabrous longer than the straight awn, radical leaves very narrow ciliated. *p.* 42.—*Pastures.*
9. Br. *asper,* panicle branched drooping, spikelets linear-lanceolate compressed, florets remote subcylindrical hairy longer than the straight awn, leaves uniform the lower ones hairy. *p.* 42.—*Woods.*
10. Br. *sterilis,* panicle drooping slightly branched, spikelets linear-lanceolate, florets remote subcylindrical scabrous shorter than the straight awn, leaves pubescent. *p.* 43.—*Hedges.*
11. Br. *diandrus,* panicle erect slightly branched, spikelets linear-lanceolate, florets remote subcylindrical subscabrous about as long as the straight awn, stam. 2 (sometimes 3, *Schrad.*), leaves subglabrous. *p.* 43.—*Hedges.*

25. AVENA.

Glume 2-valved, many-flowered. *Perianth* bivalved ; *valves* lanceolate, firmly inclosing the *caryopsis; ext.* one bearin twisted *awn* on its back.

1. A. *fatua,* panicle erect, spikelets drooping of about 3 flowers, florets smaller than the glume hairy below, root fibrous (annual). *p.* 43.—*Fields.*
2. A. *pubescens,* panicle erect nearly simple, spikelets of about 3 flowers which are longer than the glume, their pedicels villous, leaves plane downy, edges smooth. *p.* 43.—*Hilly pastures.*
3. A. *planiculmis,* panicle erect slightly branched (subspicate), spikelets of about 5 flowers which are much longer than the glume, margins of the leaves and the sheaths scabrous, culms and sheaths compressed. *p.* 43.—*Alps.*
4. A. *pratensis,* raceme erect simple, spikelets of about 5 flowers which are longer than the glume, leaves glabrous finely serrated, lower ones involute. *p.* 44.—*Mountain pastures.*
5. A. *flavescens,* panicle much branched lax, spikelets of about

3 flowers which are longer than the very unequal valves of the glume, root creeping. *p.* 44.—*Pastures.*

26. CYNOSURUS.

Glume bivalved, 2—5-flowered, having a pectinated *involucrum. Perianth* with linear lanceolate valves; *ext.* awnless or awned below the extremity. *Caryopsis* incorporated with the *perianth.*

1. C. *cristatus*, raceme spiked linear, florets with a very short awn. *p.* 39.—*Pastures.*

ORDER II. CYPERACEÆ. *Juss. Br.*

Flowers supported by a chaffy *scale* (glume). *Perianth* none, or composed of bristles, rarely a membrane, 1—3-leaved. *Stam.* hypogynous, generally 3. *Anthers* inserted by their base. *Ovary* superior, with one erect *Ovule. Style* single, generally trifid, rarely bifid. *Stigmas* entire. *Achenium* crustaceous or bony. *Embryo* lenticular, inclosed in the base of a copious *albumen. Plumule* included in the substance of the *Embryo.* —*Stems* slender or triangular; sometimes with an indefinite number of angles, usually without joints, sometimes jointed and branched. *Leaves* with an entire *sheath*, which is sometimes fissile when old: the floral ones generally destitute of sheath. *Scales* disposed in spikes, those at the bottom without flowers. *Br.*

1. ERIOPHORUM.

Scales imbricating the spike on all sides. *Achenium* with very long silky hairs springing from the base.

* *Spike solitary.*

† *Culm naked.*

1. E. *alpinum*, culm triangular, leaves much shorter than the sheaths, spike oblongo-ovate. *p.* 20.—*Alps.*

†† *Culm leaf-bearing.*

2. E. *vaginatum*, culm above triangular, spike ovate. *p.* 20.—*Bogs.*
3. E. *capitatum*, culm rounded to the top, spike nearly sphærical. *p.* 20.—*Alps, rare.*

** *Spikes many on a culm, pedunculated.*

4. E. *gracile*, culms trigonous channelled, spikes longer than the involucre. *p.* 20.—*Alps.*
5. E. *angustifolium*, culms subtrigonous, leaves linear grooved, involucre longer than the flowering spikes. *p.* 21.—*Bogs.*
6. E. *polystachyon*, culms trigonous, leaves broadly linear plane, involucrum longer than the flowering spikes. *p.* 21.—*Bogs.*

2. SCHŒNUS.

Scales imbricating the spike on all sides, the exterior ones smaller, without flowers. *Achenium* naked or with a few bristles at its base.

* *Culms leafy.*

1. Sch. *albus*, culm triangular, leaves linear-setaceous, flowers terminal subcorymbose as long as the involucrum. *p.* 16.—*Bogs.*

** *Culms naked.*

2. Sch. *nigricans*, culm rounded, spikelets of flowers collected into an ovate cluster, involucrum of two leaves, the exterior one longer than the flowers. *p.* 16.—*Bogs.*
3. Sch. *compressus*, culm roundish, spike distichous shorter than the monophyllous involucrum, spikelets many-flowered, leaves plane. *p.* 16.—*Bogs, rare.*
4. Sch. *rufus*, culm rounded, spike distichous longer than the involucrum, spikelets few-flowered, leaves setaceous channelled. *p.* 17.—*Wet moors.*

3. SCIRPUS.

Scales imbricating the spike on all sides, one or two of the outer ones occasionally without flowers. *Achenium* naked, or with bristles at its base.

* *Spike solitary.*

† *Culms simple.*

1. Sc. *cæspitosus*, culm rounded, sheath terminating in the rudiments of leaves, two outer scales as long as the spike involucrate, stigmas 3. *p.* 17.—*Moors.*
2. Sc. *pauciflorus*, culm rounded, sheaths leafless, spike ovate naked, scales obtuse nearly equal, two outer ones the largest but shorter than the spike, stigmas 3. *p.* 17.—*Mountains.*
3. Sc. *palustris*, culm rounded, sheaths at the base leafless, spike oblongo-ovate naked, scales nearly equal in size, stigmas 2. *p.* 18.—*Marshes.*
4. Sc. *acicularis*, culm compressed grooved, sheaths leafless, spike ovate acute naked (no involucrum), scales acuminate, stigmas 3, fruit without bristles. *p.* 18.—*Marshes.*

†† *Culms branched.*

5. Sc. *fluitans*, culm rounded leafy flaccid, spikes ovate naked (no involucrum), scales rather obtuse, stigmas 2, fruit destitute of bristles. *p.* 18.—*Ditches.*

** *Spikelets many.*

† *Culms rounded.*

6. Sc. *lacustris*, upper sheaths leafy, cyme terminal twice compound, involucrum 2-leaved. *p.* 18.—*Sides of lakes.*
7. Sc. *setaceus*, culms setaceous rounded or very slightly com-

pressed, sheaths leafy, spikelets terminal geminate, involucrum 1-leaved. *p.* 19.—*Wet gravelly places.*

†† *Culms triangular.*

8. Sc. *maritimus*, culm leafy, spikelets terminal clustered pedunculate and sessile, involucre of many foliaceous leaflets, scales with a mucro between the acute segments of a notch. *p.* 19.—*Salt marshes.*
9. Sc. *sylvaticus*, culm leafy, cyme terminal many times compounded, involucrum of many foliaceous leaflets, scales entire acute. *p.* 19.—*Wet woods.*

4. CLADIUM.

Scales imbricating the spikelets on all sides; outer ones sterile. *Stam.* 2. *Style* 1. *Fruit* a *Nut* with a loose external coat (*Epicarp.*), destitute of bristles at its base.

1. Cl. *Mariscus*, panicle much divided leafy, spikelets capitato-glomerate, culm rounded leafy, margins of the leaves and keels rough. *p.* 11.—*Bogs, very rare.*

5. CAREX.

Generally monœcious. *Scales* imbricating the spikes on all sides. *Barren flowers.* *Perianth* 0. *Stam.* 3. *Fertile flowers* (in the same or on different spike). *Perianth* monophyllous, urceolate, surrounding and concealing the ovary. *Stigmas* 2—3. *Nut* or *Achenium* included in the enlarged perianth.

* *Spike simple, solitary, the upper part formed of sterile, the lower of fertile flowers* (except in *C. dioica* and *Davalliana*, which are diœcious).

1. C. *dioica*, spike simple diœcious, fruit ascending ovate shortly acuminated striated rough at the margin upwards. *p.* 260.—*Mountains.*
2. C. *Davalliana*, spike simple diœcious, fruit ovate much acuminated recurvato-deflexed smoothish at the margin. *p.* 20.—*Alpine bogs.*
3. C. *pulicaris*, spike simple androgynous, flowers few, fruit distant oblongo-lanceolate acuminate reflexed, stigmas 2. *p.* 261.—*Bogs.*
4. C. *pauciflora*, spike simple androgynous of very few flowers, fruit distant lanceolato-subulate patenti-reflexed, stigmas 3. *p.* 261.—*Alps.*

** *Culm divided upwards into several spikes, which are sessile, androgynous, with a subamplexicaul bractea at the base, and flowers with two stigmas.*

† *Spikelets sterile at their extremity* (except in *C. arenaria* and *C. intermedia.*).

5. C. *incurva*, spikelets sterile at their extremity collected into

a roundish head, fruit broadly rotundato-ovate shortly acuminated swelling on both sides nearly entire at the point, culm obtusely angular, leaves channelled. *p.* 261.—*Sandy sea-shores, rare.*

6. C. *arenaria*, lower spikelets fertile upper ones sterile all crowded, fruit with a membranous margin, bracteas membranaceous the lower ones subfoliaceous, culm triangular, leaves plane. *p.* 261.—*Sandy sea-shores.*

7. C. *intermedia*, inferior and terminal spikelets fertile, the intermediate ones sterile, fruit acutely margined, culms triangular. *p.* 262.—*Marshes.*

8. C. *divisa*, spikelets sterile at their extremity crowded into a somewhat ovate head, the lower ones simple or compound with a leafy erect bractea at their base, fruit roundish ovate convex on one side slightly concave on the other acutely angular cloven at the point. *p.* 262.—*Marshes.*

9. C. *muricata*, spikelets sterile at their extremities subcompounded collected into a rather long more or less interrupted spike, fruit convexo-plane ovato-acuminate acutangular divergent rough at the margin upward. *p.* 262.—*Marshes.*

10. C. *vulpina*, spikelets sterile at their extremities thrice compounded collected into a cylindrical crowded spike, fruit ovate acuminated convexo-plane acutangular divergent, stem very acutely triangular, leaves rather broad. *p.* 262.—*Watery places.*

11. C. *paniculata*, spikelets sterile at their extremity thrice compounded and collected into a panicled spike, fruit broadly ovate acuminated gibbous on both sides with a somewhat membranaceous margin towards the extremity. *p.* 262.—*Marshes.*

†† *Spikelets sterile at their base.*

12. C. *stellulata*, spikelets sterile at their base 3 or 4 distant, fruit ovate much attenuated convex or plane acutangular divaricated rough at the margins. *p.* 263.—*Moist heaths.*

13. C. *curta*, spikelets sterile at their base about 5 rather distant elliptical, bracteas very minute (except the lower one), fruit broadly ovate acute convex on one side and nearly plane on the other subobtusangular with 2 teeth at the extremity. *p.* 263.—*Bogs.*

14. C. *ovalis*, spikelets sterile at the base oval about 5 approximate, fruit as long as the scale ovato acuminate convex on one side concave on the other with a membranaceous margin, bifid at the point. *p.* 263.—*Marshes.*

15. C. *remota*, spikelets sterile at the base distant, fruit longer than the scale oblongo-ovate acuminate convexo-plane subacutangular obtuse at the margins the point bifid, bracteas very narrow reaching beyond the culm. *p.* 263.—*Woods.*

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*** *Sterile and fertile flowers upon distinct spikes on the same culm.*

† *Sterile spikes mostly single.*

÷ *Stigmas 3.*

16. C. *pendula,* sheaths elongated nearly equal to the flowerstalks, fertile spikes cylindrical very long and drooping, fruit ovate shortly acuminate bifid at the extremity closely imbricated, leaves broad. *p.* 264.—*Woods and shady places.*
17. C. *strigosa,* sheaths elongated equal to the flowerstalks, fertile spikes slender filiform nearly erect, fruit ovato-lanceolate nerved slightly recurved loosely imbricated, leaves rather broad. *p.* 264.—*Woods.*
18. C. *sylvatica,* sheaths half as long as the flowerstalks, fertile spikes filiform rather slender slightly drooping, fruit broadly ovate much acuminated cleft at the point, leaves narrow. *p.* 264.—*Woods.*
19. C. *depauperata,* sheaths much shorter than the flowerstalks, fertile spikes erect remote very few-flowered, fruit large nearly globose inflated terminating in a long beak bifid at the point. *p.* 264.—*Woods, rare.*
20. C. *Mielichoferi,* sheaths about half as long as the flowerstalks, fertile spikes 1—3 somewhat drooping, fruit scarcely longer than the scale lax especially the lower ones with a short beak bifid at the point. *p.* 265.—*Mountains.*
21. C. *capillaris,* common sheath half the length of the flowerstalks, fertile spikes few-flowered lax drooping, fruit as long as the ovate membranaceous deciduous scales oblongo-ovate acuminate. *p.* 265.—*Alps.*
22. C. *limosa,* sheaths extremely short scarcely any, fertile spikes oblongo-ovate pendulous, bracteas subsetaceous, scales acute as long as the elliptico-roundish striated shortly mucronated fruit. *p.* 265.—*Bogs in the mountains.*
23. C. *rariflora,* sheaths very short almost none, fertile spikes narrow oblong very few-flowered lax pendulous, bracteas subsetaceous, scales acute longer and broader than the ovate somewhat acute striated fruit. *p.* 265.—*Alps.*
24. C. *Pseudo-cyperus,* sheaths scarcely any (except, sometimes, to the lowermost bractea), fertile spikes upon long footstalks cylindrical pendulous, bracteas very leafy, scales setaceous, fruit oblong very much acuminated cloven at the tips striated. *p.* 265. —*Sides of lakes.*
25. C. *ustulata,* sheaths elongated shorter than the flowerstalks, fertile spikes pendulous, bracteas nearly leafless, fruit elliptical ovate beaked (black) bifid at the point. *p.* 266.—*Alps.*
26. C. *atrata,* sheaths scarcely any, fertile spikes pedunculated

ovate pendulous, the terminal one with sterile flowers at the base, bracteas subfoliaceous, fruit roundish ovate depressed with a short beak bifid at the point. *p.* 266.—*Alps.*

27. C. *pallescens*, sheaths scarcely any, fertile spikes pedunculated oblongo-cylindrical subpendulous, bracteas subfoliaceous, fruit ovato-elliptical tumid obtuse glabrous. *p.* 266.—*Marshes.*

28. C. *flava*, sheaths short about equal to the flowerstalks, bracteas long foliaceous, fertile spikes roundish-oval, fruit obovate with a long recurved beak bifid at the point. *p.* 266.—*Bogs and moist heaths.*

29. C. *fulva*, sheaths elongated shorter than the flowerstalks, bracteas foliaceous, spikes oblongo-ovate distant, fruit roundish ovate inflated rostrate bifid at the point, culm scabrous. *p.* 266. —*Hilly pastures.*

30. C. *extensa*, sheaths very short scarcely any with extremely long foliaceous bracteas, fertile spikes subsessile oblong, fruit ovate scarcely beaked striated bifid at the point, leaves very narrow, culm glabrous. *p.* 267.—*Pastures near the coast, rare.*

31. C. *distans*, sheaths elongated about equal to the flowerstalks, bearing foliaceous bracteas, fertile spikes oblong erect, scales mucronate, fruit ovate somewhat inflated subtriquetrous depressed with rather a short beak bifid at the point. *p.* 267.—*Marshes.*

32. C. *præcox*, sheaths short scarcely any equal to the flowerstalks, fertile spikes oblong approximate, scales elliptical-oblong, fruit obovate subtriquetrous acute pubescent. *p.* 267.—*Heathy pastures.*

33. C. *pilulifera*, sheaths none, bracteas small subfoliaceous, fertile spikes sessile roundish approximate, scales mucronate, fruit obovato-globose acute pubescent, culms weak scabrous. *p.* 267. —*Moors.*

34. C. *panicea*, sheaths elongated shorter than the flowerstalks, fertile spikes subcylindrical with distant flowers, bracteas foliaceous, fruit subglobose somewhat inflated obtuse glabrous entire at the point. *p.* 267.—*Marshes.*

35. C. *recurva*, sheaths short scarcely any, bracteas subfoliaceous, fertile spikes subcylindrical drooping, fruit obovato-globose obtuse rather downy entire at the point. *p.* 268.—*Moors.*

++ *Stigmas* 2.

36. C. *pulla*, sheaths none, bracteas foliaceous, fertile spikes ovate the lower one pedunculated, scales oblong, fruit subglobose apiculate with a short bifid beak. *p.* 268.—*Alps.*

37. C. *cæspitosa*, sheaths none, bracteas foliaceous auricled at the base, spikes sessile oblong or subcylindrical obtuse, fruit broadly elliptical. *p.* 268.—*Marshes and Alps.*

38. C. *stricta*, sheaths none, bracteas with small auricles at the base short subfoliaceous, fertile spikes nearly sessile cylindrical filiform acuminate, fruit ovate somewhat acute plane above on each side, culm acutely triangular straight. *p.* 268.—*Watersides.*

†† *Sterile spikes several on a culm* (*in* C. lævigata *mostly solitary*).

+ *Stigmas* 2.

39. C. *acuta*, sheaths none, bracteas long foliaceous, fertile spikes long cylindrical acuminate slender erect when in fr., fruit oval swelling subacuminate entire at the point, culm acutely angular scabrous. *p.* 269.—*Water-sides.*

++ *Stigmas* 3.

40. C. *paludosa*, sheaths none, bracteas very long foliaceous, scales of the sterile spike obtuse, fertile spikes cylindrical obtuse, fruit oblongo-ovate acute bifid at the point striated. *p.* 269.—*River-banks.*

41. C. *riparia*, sheaths none, bracteas very long foliaceous, scales of the sterile spike acuminate, fertile spikes scarcely pedunculated broadly cylindrical acute, fruit ovate subacuminated bifid at the point. *p.* 269.—*River-banks.*

42. C. *lævigata*, sheaths elongated shorter than the flowerstalks, bracteas foliaceous, fertile spikes drooping cylindrical, all the scales acuminated or mucronate, fruit ovate triangular with rather a long acuminated beak bifid at the point. *p.* 269.—*Marshes.*

43. C. *vesicaria*, sheaths none, bracteas foliaceous long, fertile spikes cylindrical slightly drooping, scales lanceolate, fruit broadly ovate inflated subulato-rostrate deeply bifid at the point. *p.* 269.—*Bogs.*

44. C. *ampullacea*, sheaths none, bracteas foliaceous, fertile spikes cylindrical long nearly erect, scales lanceolate, fruit crowded subglobose inflated setaceo-rostrate slightly bifid at the point. *p.* 270.—*Bogs.*

45. C. *hirta*, hairy, sheaths elongated nearly equal to the flowerstalks, bracteas long foliaceous, fertile spikes short cylindrical distant their scales cuspidate, fruit ovate with a long beak hairy. *p.* 270.—*Pastures and woods.*

46. C. *filiformis*, glabrous, sheaths scarcely any, bracteas long very narrow, fertile spikes shortly pedunculate oblongo-cylindrical, their scales subcuspidate, fruit ovate shortly beaked bifid at the point very pubescent. *p.* 270.—*Bogs.*

ORDER III. RESTIACEÆ. *Br. Prodr.*

Flowers glumaceous. *Perianth* 2—6-partite, seldom none. *Stam.* hypogynous, 1—6; when 2 or 3, in a 4—6-divided perianth, opposite the inner segments of the latter. *Ovary* superior, with 1 or more cells; *ovules* solitary, pendulous. *Pericarp* capsular or nucamentaceous. *Seeds* inverted. *Embryo* lenticular, within the base of the copious *albumen.—Herbs* or *under-shrubs*. *Leaves* simple, narrow, or none. *Culms* naked, or, more usually, with sheaths slit on one side. *Flowers* generally monœcious or diœcious, in spikes or heads and separated by *scales* or *bracteas*. *Br.*

1. ERIOCAULON.

Flowers collected into a compact scaly head, monœcious. *Barren flowers* in the disk. *Perianth* 4-cleft, the two inner segments united nearly to their summit. *Stam.* 4—6. *Fertile Fl.* in the circumference. *Perianth* single, deeply 4-partite. *Style* 1. *Stigmas* 2—3. *Caps.* 2—3-lobed, 2—3-celled. *Cells* 1-seeded.

1. E. *septangulare*, scape striated longer than the cellular compressed ensiform leaves, head of flowers globose, its ext. scales without flowers glabrous, the interior ones as well as the perianths ciliato-pilose at the extremity, stam. 4. *p.* 270.—*Lakes in Skye.*

ORDER IV. JUNCEÆ. *Juss.*

Perianth 6-partite, subglumaceous. *Stam.* 6, inserted into the base of the segments, or sometimes 3, and then opposite the outer segments. *Ovary* superior, 1—3-celled, 1—many-seeded, or 1-celled and 3-seeded. *Style* 1. *Stigmas* usually 3, sometimes 1. *Pericarp* capsular, with 3 valves bearing the dissepiment in the middle, rarely closed and by abortion 1-seeded. *Embryo* cylindrical, at the base of a hard fleshy or cartilaginous *albumen*. *Br.* In conspicuous herbs with small flowers, which are often brown, rarely petaloid. *Leaves* grassy, sometimes wanting.

1. JUNCUS.

Perianth 6-partite, glumaceous. *Stam.* 6. *Caps.* 3-celled, 3-valved; valves bearing the partitions down the middle, to which the numerous seeds are fixed. (*Leaves* rounded, rarely plane, glabrous.)

* *Leaves none* (*flowers all lateral*).

1. J. *arcticus*, scapes smooth (soft), heads of flowers compact nearly sessile, leaves of the perianth ovato-lanceolate acute rigid rather shorter than the broadly obovate capsule. *p.* 104. *Sea-shore, rare.*

2. J. *glaucus*, scape deeply striated (rigid), panicle very much branched erect, leaves of the perianth lanceolate subulate membranous longer than the elliptical capsule. *p.* 105.—*Wet pastures.*

3. J. *effusus*, scapes very faintly striated (soft), panicle loose very much branched spreading, leaflets of the perianth lanceolate acuminate rather longer than the obovate obtuse capsule. *p.* 105.—*Wet pastures.*
4. J. *conglomeratus*, scapes very faintly striated (soft), panicle much branched very dense globular, leaflets of the perianth lanceolate acute about as long as the broadly ovate very obtuse capsule, stam. 3. *p.* 105.—*Wet pastures.*
5. J. *filiformis*, scapes filiform, panicle of very few flowers (from near the middle of the culm), capsules rotundato-ovate shorter than the perianth. *p.* 105.—*Stony margins of lakes.*

*** Leaves all radical (flowers terminal).*

6. J. *squarrosus*, leaves setaceous (rigid) grooved, panicle terminal elongate compound, capsules elliptical ovate. *p.* 105.—*Moors.*
7. J. *capitatus*, leaves filiform (soft) plane or grooved above, heads of flowers sessile terminal shorter than the bractea, leaflets of the perianth acuminato-aristate. *p.* 106.—*Alps.*
8. J. *triglumis*, leaves linear-subulate compressed, heads terminal erect of about three flowers sessile longer than the membranaceous involucre, leaflets of the perianth obtuse longer than the elliptical capsule. *p.* 106.—*Mountains.*
9. J. *biglumis*, leaves linear-subulate compressed, heads terminal a little leaning of two flowers one of them pedicellate shorter than the foliaceous involucre, leaves of the perianth obtuse longer than the turbinate emarginated capsule. *p.* 106.—*Alps.*

**** Culms leafy.*

† Leaves nearly plane, but grooved above.

10. J. *castaneus*, leaves subulate grooved and laterally compressed, heads generally single sessile or pedunculate shorter than the bractea, capsules ovate, culm unifoliate. *p.* 107.—*Alps, rare.*
11. J. *trifidus*, sheaths fringed those at the base of the culm leafless, bracteas foliaceous very long grooved, heads of about 3 flowers terminal, culm unifoliate. *p.* 107.—*Alps.*
12. J. *bulbosus*, culm simple leafy compressed, leaves linear-setaceous grooved, panicle terminal compound subcymose generally shorter than the bractea, capsules rotundato-ovate longer than the obtuse incurved leaflets of the perianth. *p.* 107.—*Marshes.*
13. J. *bufonius*, culm dichotomous above panicled, leaves filiform setaceous grooved, flowers solitary unilateral mostly sessile, capsules elliptical ovate much shorter than the very acuminated leaflets of the perianth. *p.* 108.—*Wet gravelly places.*
14. J. *tenuis*, culm above shortly dichotomous panicled, leaves linear-setaceous grooved, flowers solitary but approximate mostly sessile, capsules nearly sphærical shorter than the very acuminated leaflets of the perianth. *p.* 108.—*Mountains, rare.*

15. J. *uliginosus*, " leaves setaceous grooved, flowers 3 together sessile, capsule obtuse longer than the perianth, culm bulbous rooting." *p.* 108.—*Marshes.*

†† *Leaves rounded or subcompressed, divided internally by partitions, which often, in a dry state, give a jointed appearance to the leaves.*

16. J. *subverticillatus*, cauline leaves subulate nodoso-articulate, panicle corymbose, heads of about 5 flowers fasciculato-verticillate, capsule obtuse as long as the striated perianth. *p.* 109.—*Marshes.*

17. J. *acutiflorus*, leaves nodoso-articulate subcompressed, panicle terminal very compound, leaves of the perianth lanceolate nearly as long as the narrow ovate subacuminate capsule. *p.* 109.—*Bogs.*

18. J. *lampocarpus*, leaves compressed, panicle terminal compound erect, three interior leaves of the perianth rather obtuse, capsule acute triquetrous shining. *p.* 109.—*Bogs.*

19. J. *obtusiflorus*, leaves rounded nodoso-articulate, panicle very much compounded spreading, leaflets of the perianth very obtuse as long as the capsule. *p.* 109.—*Marshes.*

20. J. *polycephalus*, leaves subulate rounded articulate, panicle terminal erect di-trichotomous, branches nearly simple, heads of many flowers lateral and terminal nearly sessile, leaflets of the perianth lanceolate acute rather shorter than the elliptical-ovate somewhat obtuse capsule. *p.* 110.—*Alps.*

2. LUZULA.

Perianth 6-partite, glumaceous. *Stam.* 6. *Caps.* 3-celled, 3-valved, valves without dissepiments, 1 *seed* in each cell, fixed to the bottom. (*Leaves* plane, generally pilose.)

1. L. *maxima*, leaves hairy, panicle subcymose doubly compound, peduncles elongate of about 3 flowers, leaflets of the perianth aristate as long as the capsule. *p.* 110.—*Woods.*

2. L. *pilosa*, leaves hairy, panicle subcymose, peduncles 1-flowered bent back, leaflets of the perianth acuminate rather shorter than the obtuse capsule. *p.* 110.—*Woods.*

3. L. *Forsteri*, leaves hairy, panicle subcymose but little branched, peduncles 1-flowered erect, leaflets of the perianth narrow acuminate a little longer than the acute capsule. *p.* 110.—*Woods.*

4. L. *campestris*, leaves hairy, spikes sessile and pedunculated, leaflets of the perianth acuminate longer than the obtuse capsule. *p.* 110.—*Pastures.*

5. L. *spicata*, spike drooping compound, spikelets shorter than their subdiaphanous mucronated bracteas, leaflets of the perianth acuminato-aristate about as long as the rotundate capsule. *p.* 111.—*Alps.*

3. NARTHECIUM.

Perianth 6-partite, coloured. *Stam.* 6; *filam.* hairy. *Caps.* 3-celled, 3-valved. *Seeds* numerous, ovato-oblong, appendiculate at each extremity.

1. N. *ossifragum. p.* 103.—*Moors.*

ORDER V. BUTOMEÆ. *Rich. in Mem. du Mus.*

Perianth with the 3 inner segments petaloid. *Stam.* hypogynous. *Ovaries* superior. *Follicles* polyspermous. *Seeds* ascending, attached to veins running like net-work over all the inside of the *capsule. Albumen* none. *Embryo* with the same direction as the *seed. Rich.*

1. BUTOMUS.

Perianth 6-partite. *Stam.* 9. *Ovaries* 6. *Styles* 6. *Caps.* 6, many-seeded.

1. B. *umbellatus. p.* 123.—*Ditches and lakes.*

ORDER VI. MELANTHACEÆ. *Br. Prodr.*

(*Colchicaceæ, Decand.*)

Perianth petaloid, 6-partite, or tubular by the cohesion of the claws of the segments, which are often rolled inwards before expansion. *Stam.* 6, perigynous. *Anthers* usually turned outwards. *Ovary* superior, with 3 cells and many *seeds. Style* partly or entirely divided into 3. *Stigmas* undivided. *Caps.* generally separable into 3 valves. Integument of the *seed* neither black nor crustaceous, but membranous. *Albumen* firm, fleshy. *Br.*

1. COLCHICUM.

Perianth tubular, very long, rising from a *spatha*; limb 6-partite, campanulate. *Ovary* 1. *Styles* 3, very long. *Capsule* 3-celled; *cells* united at the base.

1. C. *autumnale,* leaves plane broadly lanceolate erect. *p.* 114. —*Pastures, rare.*

2. TOFIELDIA.

Perianth 6-partite, with a small tripartite *involucre. Caps.* 3—6-celled, cells united at the base.

1. T. *palustris,* spike ovate, scape glabrous filiform naked, petals obovate obtuse, germen oblong 3-lobed, involucre at the base of the pedicel. *p.* 114.—*Alps.*

ORDER VII. ASPARAGEÆ. *Juss.*

(*Smilaceæ, Br.*)

Perianth 6- or 8-partite, or 6-cleft, petaloid, regular. *Stam.* 3—6 or 8, hypogynous or perigynous, the three opposite the outer segments usually of a different form. *Ovary* superior, 3—4-celled; *cells* 1—2- or many-seeded. *Style* 1. *Stigma* tripartite. *Fruit*, a berry. Integument of the *seeds* generally membranous. *Albumen* corneous.

1. ASPARAGUS.

Perianth 6-partite. *Stam.* 6. *Berry* 3-celled. *Cells* 2-seeded.

1. A. *officinalis*, unarmed, stem herbaceous erect rounded very much branched, leaves setaceous fasciculate flexible, peduncles jointed in the middle. *p.* 103.—*Sands, sea-side.*

2. RUSCUS.

Diœcious. *Barren Fl. Perianth* 6-partite. *Filaments* united into a tube. *Anth.* 3—6. *Fertile Fl. Perianth* 6-partite. *Nectary* tubular. *Style* 1. *Stigma* 1. *Berry* 3-celled; *cells* 2-seeded.

1. R. *aculeatus*, stem rigid branched, leaves ovato-acuminate very rigid bearing the solitary flower on its upper surface. *p.* 288. —*Woods, rare.*

3. CONVALLARIA.

Perianth campanulate or cylindrical, 6-cleft. *Berry* 3-celled. *Stigma* trigonous.

* *Flowers campanulate.*

1. C. *majalis*, scape semicylindrical, leaves ovato-lanceolate binous, flowers racemoso-spicate campanulate drooping on short footstalks. *p.* 103.—*Woods.*

** *Flowers cylindrical.*

2. C. *verticillata*, leaves lanceolate whorled. *p.* 103.—*Woods, rare.*
3. C. *multiflora*, leaves ovato-elliptical alternate half embracing the rounded stem with their base, peduncles axillary 1- or many-flowered, filaments hairy, style flexuose. *p.* 104.—*Woods.*

4. PARIS.

Perianth 8-partite, four inner segments somewhat coloured. *Stam.* 8. *Cells* of the *Anth.* fixed, one on each side the middle of a subulate *filament*. *Stigmas* 4. *Berry* 4-celled, 4-seeded.

1. P. *quadrifolia. p.* 122.—*Wet woods.*

ORDER VIII. ASPHODELEÆ. *Juss. Br.*

Perianth 6-partite, or 6-cleft, petaloid, regular. *Stam.* 6, either perigynous or hypogynous; the three opposite the outer segments either of a different form or absent. *Ovary* superior, 3-celled; *cells* 1—2, many-seeded. *Style* 1. *Stigma* simple. *Capsule* 3-celled, 3-valved, bearing the septa in the middle. *Integument* of the *seed* black, crustaceous and brittle. *Albumen* fleshy or cartilaginous.

1. ORNITHOGALUM.

Perianth 6-partite. *Stam.* dilated at the base, hypogynous.

* *Flowers yellow.*

1. O. *luteum*, stem angular bearing two leaves (immediately below the umbel), flowerstalks forming an umbel undivided glabrous, leaves of the perianth lanceolate. *p.* 102.—*Woods, rare.*

** *Flowers white or greenish.*

2. O. *umbellatum*, flowers in a corymbus, peduncles longer than the bracteas, filaments subulate. *p.* 102.—*Banks.*

2. SCILLA.

Perianth 6-partite; segments spreading, deciduous. *Stam.* filiform, glabrous, perigynous. *Seeds* sphærical.

1. S. *verna*, root solid, corymb hemisphærical few-flowered, bracteas lanceolate obtuse, leaves linear channelled. *p.* 103.—*Rocks near the sea.*

3. HYACINTHUS.

Perianth tubular, 6-cleft or 6-partite, the extremities only spreading. *Stam.* filiform. *Caps.* obtusely triangular.

1. H. *non scriptus*, raceme cernuous, perianth 6-partite the extremities revolute. *p.* 102.—*Woods.*

4. ALLIUM.

Flowers umbellate, terminal, arising from a 2-leaved *spatha.* *Perianth* 6 partite, generally patent.

* *Cauline leaves plane. Stam. alternately tricuspidate.*

1. A. *arenarium*, umbels bearing bulbs compact sphærical, leaves linear with cylindrical sheaths, spatha short obtuse, petals roughish on the keel. *p.* 100.—*Sandy hills.*

** *Cauline leaves plane. Stam. all simple.*

2. A. *carinatum*, umbels bearing bulbs lax, leaves linear keeled, spatha very long unequal. *p.* 101.—*Mountains.*

*** *Cauline leaves rounded. Stam. alternately tricuspidate.*

3. A. *vineale*, umbel bearing bulbs, leaves fistulose. *p.* 101.—*Pastures.*

**** *Cauline leaves rounded. Stam. all simple.*

4. A. *oleraceum*, umbel bearing bulbs lax, leaves grooved above, spatha with two very long points. *p.* 101.—*Pastures.*

***** *Leaves all radical.*

5. A. ***ursinum***, umbel nearly plane, leaves ovato-lanceolate on footstalks, scape triangular. *p.* 101.—*Woods.*
6. A. *Schœnoprasum*, leaves rounded subulato-filiform, scape rounded as long as the leaves. *p.* 101.—*Pastures.*

ORDER IX. LILIACEÆ. *Juss.*

(*Narcissorum, Sect. I. Juss. Hemerocallideæ, Br.*)

Perianth coloured, equal, 6-partite, or, by the cohesion of the claws of the segments into a tube, 6-cleft. *Stam.* 6, inserted either into the base of the segments, or the tube. *Ovary* superior, 3-celled, many-seeded. *Stigma* simple or 3-lobed. *Caps* 3-celled. *Seeds* flat, with a spongy, dilated, often winged, integument, neither black nor crustaceous. *Albumen* fleshy. *Embryo* with the same direction as the *seed.*—*Flowers* large, usually of vivid colours, often solitary. *Leaves* fleshy, cauline indistinctly nerved. *Root* bulbous. *Br.*

1. TULIPA.

Perianth campanulate, 6-partite. *Stigma* thick, sessile. *Caps.* triangular.

1. T. *sylvestris*, stem 1-flowered somewhat drooping, segments of the perianth ovato-acuminate bearded at the extremity, stam. hairy at the base, stigma obtuse. *p.* 102.—*Pastures, rare.*

ORDER X. AMARYLLIDEÆ. *Br. Prodr.*

(*Narcissorum.* SECT. II. *Juss.*)

Perianth coloured, 6-partite or 6-cleft. *Stam.* 6, inserted into the segments; the *filaments* sometimes united by a membrane. *Anthers* turned inwards. *Ovary* inferior, 3-celled, many-seeded; or, in those whose fruit is fleshy, 1—2-seeded. *Style* 1. *Stigma* 3-lobed. *Pericarp* capsular; either dry with 3 valves, 3 cells, bearing the septa in their middle, and many *seeds;* or fleshy with 1—3 seeds. *Integument* of the *seed* not crustaceous. *Embryo* straight, in the axis of a fleshy *albumen*, having the same direction as the *seed.*—*Flowers* large, generally of a bright colour. *Leaves* fleshy, indistinctly nerved, all radical. *Roots* bulbous. *Br.*

1. NARCISSUS.

Flowers spathaceous. *Perianth* infundibuliform, the limb patent, 6-partite. *Crown* (*Nectary, Linn.*) at the mouth of the perianth, petaloid cylindrical or campanulate, entire or divided. *Stam.* inserted in the tube and concealed within the *crown.*

1. N. *pseudo-Narcissus,* spatha 1-flowered, crown campanulate erect curled at the margin obsoletely 6-cleft as long as the ovate segments of the perianth. *p.* 100.—*Woods.*

2. GALANTHUS.

Flowers spathaceous. *Perianth* 6-partite; the three interior segments shorter, emarginate.

1. G. *nivalis. p.* 100.—*Banks and pastures.*

ORDER XI. IRIDEÆ. *Juss.*

(*Ensatæ, Ker in Bot. Mag.*)

Perianth coloured, 6-cleft, or 6-partite; sometimes irregular. *Stam.* 3, inserted into the base of the outer segments; *filaments* sometimes united; *anthers* affixed by their base, turned outwards. *Ovary* inferior, 3-celled, many-seeded. *Style* 1. *Stigmas* 3, lamellated or dilated into the form of petals, rarely 2-lipped; sometimes 1 stigma obscurely 3-lobed. *Caps.* 3-celled, 3-valved; *valves* bearing the *septa* in the middle. *Seeds* round, hard. *Albumen* horny or firmly fleshy. *Embryo* with the same direction as the *seed.*—*Herbs,* rarely undershrubs. *Leaves* equitant, in two ranks, with their edges turned upwards (except in *Crocus*). *Flowers* spathaceous, terminal, either in a spike or corymbs or panicle; sometimes partly under ground. *Br.*

1. IRIS.

Perianth 6-cleft, petaloid, each alternate segment reflexed. *Stigmas* petaliform.

1. I. *Pseudacorus,* leaves ensiform, each alternate segment of the beardless perianth smaller than the stigma. *p.* 16.—*Ditches.*

ORDER XII. ALISMACEÆ. *Rich.*

Perianth with the three inner segments petaloid. *Stam.* hypogynous. *Ovaries* superior. *Pericarps* indehiscent. *Seeds* solitary, or two attached to the suture at a distance from each other, erect or ascending. *Albumen* none. *Embryo* curved like a horse-shoe, with the same direction as the seed.—*Aquatics. Leaves* radical, on long stalks, fleshy, with indistinct nerves. *Flowers* white, panicled. *Rich.*

1. ALISMA.

Stam. 6. *Ovary* and *styles* numerous. *Pericarps* numerous, clustered but distinct, 1-seeded.

1. A. *Plantago,* leaves ovate acute, fruit depressed, pericarps obtusely trigonal. *p.* 114.—*Banks of lakes.*

2. A. *ranunculoides*, leaves linear-lanceolate, fruit globose squarrose, pericarps acute. *p.* 115.—*Bogs and ditches.*

ORDER XIII. HYDROCHARIDEÆ. *Rich.*

Perianth 3—6-parted, the three inner segments petaloid. *Stam.* epigynous. *Ovary* inferior. *Stigmas* 3—6. *Berry* with one or more cells. *Embryo* straight, in a direction contrary to that of the *seed;* very rarely with a dilated base.—*Leaves* radical, often floating, rarely rigid and submersed. *Flowers* white. *Rich.*

1. HYDROCHARIS.

Flowers diœcious, with the three inner segments of the *perianth* the largest, petaloid. *Barren Fl. Stam.* 9, "the three interior filaments beaked." *Sm.*

Fertile Fl. Styles 6, each with two *stigmas. Berry* roundish, 6-celled, many-seeded.

1. H. *Morsus Ranæ. p.* 290.—*Ditches.*

2. STRATIOTES.

Spatha of two carinated leaves. Three interior segments of the *perianth* very large, petaloid. *Stam.* about 20. *Styles* 6, bifid. *Berry* angular, with 6 cells, many-seeded.

1. Str. *aloides*, leaves ensiform triangular aculeato-serrate. *p.* 171. —*Ditches.*

ORDER XIV. ORCHIDEÆ. *Juss. Br.*

Perianth (*Corolla* of *authors*) 6-partite, with 1 segment (*labellum* or *lip*) of a different form from the others. Organs of fructification united into a *column. Anther* 1 or rarely 2. *Pollen* cohering in masses of a determinate figure, and usually falling out of its cells. *Capsule* 3- or 6-valved, with numerous minute *seeds* adhering to three parietal *receptacles.*—*Herbs* or *undershrubs. Root* tuberous or fibrous. *Stem* simple, rarely divided, leafy or sheathed. *Leaves* simple, entire, sheathing at the base. *Flowers* spiked, racemed, corymbose or solitary, rarely paniculated. *Pubescence*, when it exists, simple, acute, sometimes tipped with a glandular head. *Br.*

(*Monandrous*).

* *Anther adnate, nearly terminal, persistent. Pollen mass, composed of angular granules elastically cohering, fixed by its base. Br.*

1. ORCHIS.

Cor. ringent. *Lip* spurred on the underside at the base. *Glands* of the *stalks* of the *pollen-mass* (1—2) contained in one common little *pouch*.

* *Tubers 2, undivided.*

1. O. *Morio*, lip 3-lobed the lobes crenate obtuse middle one emarginate, segments of the perianth ascending obtuse, spur conical ascending shorter than the germen. *p.* 250.—*Meadows.*
2. O. *mascula*, lip 3-lobed crenulate obtuse the middle lobe cleft, segments of the perianth acute the exterior ones reflexed, spur linear ascending compressed at the extremity rather longer than the germen. *p.* 250.—*Pastures.*
3. O. *pyramidalis*, lip 3-cleft the lobes equal entire with 2 longitudinal appendages on the upper side near the base, segments of the perianth lanceolate the two outer ones spreading, spur filiform longer than the germen. *p.* 251.—*Dry pastures.*

** *Tubers 2, palmated.*

4. O. *latifolia*, lip slightly 3-lobed the side reflexed, 3 inner segments of the perianth connivent, the spur cylindrical shorter than the germen, bracteas longer than the flowers. *p.* 251.—*Marshes.*
5. O. *maculata*, lip plane 3-lobed crenate, the 3 inner segments of the perianth connivent the lateral ones patent, spur cylindrical shorter than the germen, bracteas as long as the germen. *p.* 251.—*Dry pastures.*

2. GYMNADENIA.

Cor. ringent; *lip* spurred at the base beneath. *Glands* of the *stalks* of the *pollen-mass* naked, approximate. *Br.*

1. G. *conopsea*. *p.* 251.—*Pastures.*

3. HABENARIA.

Cor. ringent; *lip* spurred on the upper side at the base beneath. *Glands* of the *stalk* of the *pollen-mass* naked, distinct, with the cells of the *footstalks* adnate or separated.

1. H. *viridis*, spur very short somewhat 2-lobed, lip linear tridentate, middle tooth very small, bracteas much longer than the flower, tubers palmate. *p.* 252.—*Dry pastures.*
2. H. *albida*, spur obtuse much shorter than the germen, lip 3-cleft, lobes acute, middle one longest. *p.* 252.—*Highland pastures.*
3. H. *bifolia*, spur filiform twice as long as the germen, lip linear entire, radical leaves binous oblongo-ovate attenuated at the base. *p.* 252.—*Marshes.*

** *Anther parallel with the stigma. Pollen mass farinaceous, or composed of angular granules, fixed to the stigma by its extremity.* Br.

4. GOODYERA.

Cor. ringent, with the 2 exterior or lateral *segments* of the *perianth* placed beneath the *lip*, which is gibbous at the base, and undivided at the extremity. *Column* free. *Pollen* angular. *Br.*

1. G. *repens*, radical leaves ovate, lips and petals lanceolate. *p.* 253.—*Woods.*

5. LISTERA.

Cor. irregular. *Lip* 2-lobed. *Column* wingless. *Anther* fixed by its base. *Pollen* farinaceous. *Br.*

1. L. *ovata*, stem with only a pair of ovato-elliptical opposite leaves, column of fructification having an appendage in which the anther is placed. *p.* 253.—*Woods.*
2. L. *cordata*, stem with only 2 cordate opposite leaves, column without any appendage behind, lip with 2 teeth at the base. *p.* 253.—*Highland pastures.*
3. L. *Nidus Avis*, stem with sheathing scales leafless. *p.* 253.—*Shady woods.*

*** *Anther terminal, inserted, persistent. Mass of pollen either pulverulent or composed of angular granules, fixed by its base or below the extremity.* Br.

6. EPIPACTIS.

Lip ventricose below, the extremity either undivided or 3-lobed, the middle lobe the largest, connected, as it were, by a joint. *Pollen* farinaceous. *Br.*

1. E. *latifolia*, leaves ovate amplexicaul, lower bracteas longer than the flowers, flowers drooping, lip entire acuminated shorter than the petals. *p.* 254.—*Woods.*
2. E. *palustris*, leaves lanceolate amplexicaul, bracteas shorter than the flower, flowers slightly drooping, lip crenate obtuse rather longer than the perianth. *p.* 254.—*Bogs.*
3. E. *pallens*, leaves ovato-lanceolate sessile, bracteas longer than the flower, lip obtuse shorter than the perianth. *p.* 254.—*Woods.*
4. E. *ensifolia*, leaves lanceolate much acuminated subdistichous, bracteas very minute subulate, flowers erect, lip obtuse much shorter than the perianth. *p.* 255.

**** *Anther terminal, moveable, deciduous. Mass of Pollen at length becoming waxy.* Br.

7. MALAXIS.

Lip plane, undivided, sessile, (often exterior,) 5 *segments* of the *perianth* narrower, spreading, or deflexed. *Masses* of *pollen* 4, parallel with each other, fixed to the *stigma* by their extremities. *Br.*

1. M. *paludosa*, leaves about 4 at the base of the stem scabrous at the extremity, scape pentagonal, lip concave acute. *p.* 255. —*Marshes.*

8. CORALLORRHIZA.

Lip produced behind, adnate with the spur, or free. *Column* free. *Masses* of *pollen* 4, oblique (not parallel). *Br.*

1. C. *innata*, spur abbreviated adnate. *p.* 255.—*Marshy woods, rare.*

ORDER XV. AROIDEÆ. *Juss.*

Flowers spathaceous on a *spadix;* sometimes with the *anthers* and *pistils* separated, and then generally naked; sometimes perfect, with a 4—6-rarely 3-partite *perianth*, the latter not petaloid. *Stam.* very numerous in those with naked *flowers:* in the genera with a *perianth* usually opposite, and equal in number to the *segments* of the latter. *Anthers* turned outwards. *Ovaries* superior, solitary, or numerous, 1—3-celled, 1—many-seeded: *ovules* erect, sometimes pendulous or parietal. *Style* none. *Stigma* 1. *Pericarp* indehiscent, baccate or capsular. *Embryo* in the axis of a fleshy *albumen*, with the same direction as the *seed*; rarely with a contrary direction, having a cleft on its side for the emission of the *plumule.*—" *Herbs* or *undershrubs*. *Root* often tuberous or incrassated. *Leaves* sheathing, simple or compound, often all radical. *Spadix* terminal, or lateral, or radical, often solitary and surrounded with a *spatha*, sometimes naked." *Br.*

SECT. I. AROIDEÆ. *Anthers and pistils separated. Perianth* 0. *Fruit a berry.*

1. ARUM.

Spatha monophyllous, cucullate, convolute at the base. *Spadix* naked at the extremity, staminiferous in the middle, with the *anthers* in many *rows;* pistilliferous at the base. *Berry* 1-celled, many-seeded.

1. A. *maculatum*, leaves all radical hastato-sagittate, lobes deflexed, spadix club-shaped obtuse shorter than the spatha. *p.* 272.—*Woods.*

SECT. II. PISTIACEÆ. *Rich. in Humb. Nov. Gen. Spadix 2-flowered, in a cucullate spatha. Flowers with anthers and pistils separate. Capsule or Utriculus.—Floating plants.*

2. LEMNA.

Male and female *flowers* collateral. *Stamens* 2. *Utriculus* 1—5-seeded[a].

1. L. *trisulca*, fronds thin elliptico-lanceolate caudate at one extremity at the other serrate, roots solitary. *p.* 10.—*Stagnant waters.*
2. L. *minor*, fronds nearly ovate compressed, roots solitary. *p.* 11. —*Stagnant waters.*
3. L. *polyrrhiza*, fronds obovato-rotundate compressed, roots numerous clustered. *p.* 11.—*Stagnant waters.*
4. L. *gibba*, fronds obovate nearly plane above hemisphærical beneath, roots solitary. *p.* 11.—*Stagnant waters, rare.*

SECT. III. TYPHINÆ. *Juss. Flowers monœcious, but surrounded by a perianth. Stam.* 3. *Ovary* 1-*seeded; ovule pendulous. Fruit an achenium.*

3. SPARGANIUM.

Flowers collected into sphærical, dense heads, which are staminiferous or pistilliferous. *Barren Fl. Perianth* of 3 leaves. *Fertile Fl. Perianth* of 3 leaves. *Drupe* dry, with 1 seed.

1. S. *ramosum*, leaves triangular at the base their sides concave, common flower-stalk branched, stigma linear. *p.* 260.—*Stagnant waters.*
2. S. *simplex*, leaves triangular at the base their sides plane, common flowerstalk simple, stigma linear. *p.* 260.—*Still waters.*
3. S. *natans*, leaves floating plane, common flowerstalk simple, stigma ovate very short, head of sterile flowers mostly solitary. *p.* 260.—*Ditches.*

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[a] The first, and, we believe, only botanist who has ventured to place *Lemna* and *Pistia* next each other is Linnæus; who could have had a very imperfect knowledge of the latter, and a far from complete acquaintance with the former. Notwithstanding the different manner in which *Pistia* and *Lemna* have been described, it is in these descriptions only that they really disagree, and not in natural affinity. Suppose what is called *perianth* at *p.* 10, Part I. to be a *spatha*; and we have a *spadix* reduced to a point bearing two naked *flowers*, of which the superior is male and diandrous, the inferior female. Let this account be compared with M. Kunth's character of *Pistia* in the *Nova Genera et Species Plantarum* of Baron Humboldt, and it will be found to be absolutely the same, except in the single particular of *capsule*. Nor can we perceive any other than generic differences between the two genera, as far as it is possible to judge of *Pistia* from Roxburgh's account of it. We ought to add, that Mr. Brown first remarked to us that *Lemna* was a reduced *Aroidea*.

4. TYPHA.

Flowers collected into long cylindrical very dense *spikes*, which are stamiiniferous or pistilliferous. *Barren Fl. Perianth* 0. *Stam.* 3 together upon a chaffy or hairy *receptacle*, and united below into one common *filament*. *Fertile Fl. Perianth* 0. *Achenium* pedicellate, surrounded at its base with *hairs* resembling a *pappus*.

1. T. *latifolia*, leaves linear nearly plane, sterile and fertile spikes close together. *p.* 259.—*Lakes*.
2. T. *angustifolia*, leaves linear convex below, sterile and fertile spikes a little distant from each other. *p.* 259.—*Lakes*.

ORDER XVI. JUNCAGINEÆ. *Rich.*

Perianth uniform, rarely none, not petaloid. *Stam.* hypogynous. *Ovaries* superior. *Ovules* solitary, or two approximated at their base, erect. *Pericarps* indehiscent. *Embryo* without *albumen*, having the same direction as the *seed*; with a lateral *cleft* for the emission of the *plumule*.—Rigid *herbs* with narrow radical *leaves*. *Flowers* spiked, not coloured. *Rich.*

1. TRIGLOCHIN.

Perianth of 6 *leaves*, deciduous, the *leaflets* concave, 3 interior *ones* inserted higher up. *Stam.* 6, very short. *Anthers* with their anterior side turned outward, subsessile. *Ovaries* 3—6, one-seeded. *Styles* short. *Stigmas* adnate. *Caps.* 3—6, valveless. *Seeds* erect. *Br.*

1. Tr. *palustre*, fruit 3-celled nearly linear. *p.* 115.—*Marshes*.
2. Tr. *maritimum*, fruit 6-celled ovate. *p.* 115.—*Salt marshes*.

ORDER XVII. FLUVIALES. *Rich.*

(*Part of Naiades. Juss.*)

Flowers unisexual or bisexual. *Ovary* 1 or more, superior. *Seed* solitary, pendulous, or suspended. *Embryo* without *albumen* having a contrary direction to the *seeds*, with a lateral *cleft* for the emission of the *plumule*.—*Floating herbs* with very vascular *leaves* and *stems*. *Flowers* inconspicuous.

1. RUPPIA.

Flowers 2, perfect, on a *spadix* arising from the sheathing *bases* of the *leaves*. *Stam.* 4, sessile. *Ovaries* 4. *Perianth* 0. *Drupes* 4, pedicellate, their *nuts* 1-seeded.

1. R. *maritima*. *p.* 59.—*Marine ditches*.

2. ZOSTERA.

Stam. and *pistils* separated, inserted in two *rows* upon one side of a *spadix.* *Spatha* foliaceous. *Perianth* 0. *Barren Fl. Anthers* ovate, sessile, alternating with the *germens* and upon the same *spadix.* *Fertile Fl. Ovary* 1, ovate. *Style* bifid. *Drupe* with 1 *seed.*

1. Z. *marina*, leaves entire somewhat 3-nerved, stem roundish. *p.* 259.—*Sea-shores.*

3. ZANNICHELLIA.

Monœcious. *Barren Fl. Perianth* 0. *Stam.* 1. *Fertile Fl. Perianth* single, of 1 *leaf.* *Ovaries* 4 or more. *Style* 1. *Stigma* peltate. *Caps.* sessile.

1. Z. *palustris*, anthers 4-celled, stigmas entire, pericarps toothed on the back. *p.* 258.—*Stagnant waters.*

4. POTAMOGETON.

Flowers perfect, on a *spadix* arising from a *spatha.* *Perianth* (*involucre, Rich.* ?). *Anthers* 4, sessile, alternating with the divisions of the *perianth.* *Ovaries* 4. *Nuts* 4, 1-seeded, sessile.

* *Upper leaves floating.*

1. P. *natans*, upper leaves floating coriaceous oblongo-ovate petiolate, lower ones membranous lanceolate gradually tapering into a footstalk. *p.* 57.—*Lakes.*
2. P. *heterophyllum*, upper leaves coriaceous elliptical petiolate floating, lower ones membranous linear-lanceolate sessile (peduncle clavate, *Sm.*). *p.* 57.—*Lakes.*
3. P. *fluitans*, upper leaves floating subcoriaceous ovato-lanceolate tapering into a rather short footstalk, lower ones long lanceolate sessile. *p.* 57.—*Ditches and lakes.*

** *Leaves all submersed.*

4. P. *perfoliatum*, leaves cordate embracing the stem. *p.* 58.—*Rivers and lakes.*
5. P. *densum*, leaves (all) opposite crowded ovato-acuminate sessile, stem forked, spike of about 4 flowers. *p.* 59.—*Ditches.*
6. P. *lucens*, leaves ovato-lanceolate petiolate. *p.* 58.—*Rivers and lakes.*
7. P. *crispum*, leaves lanceolate tapering sessile remarkably waved and crisped serrate. *p.* 58.—*Ditches.*
8. P. *lanceolatum*, leaves linear-lanceolate tapering at the base sessile. *p.* 58.—*Lakes.*
9. P. *gramineum*, "leaves linear-lanceolate alternate sessile broader than the stipules, stem rounded subdichotomous." *p.* 58.—*Ditches.*

10. P. *compressum*, leaves linear very obtuse sessile, stem spikes about 4-flowered. *p.* 58.—*Ditches.*
11. P. *pusillum*, leaves linear opposite and alternate distinct spreading from the base, stem cylindrical. *p.* 59.—*Ditches.*
12. P. *pectinatum*, leaves distichous setaceous alternate sheathing, stipules scarcely any, spike of flowers interrupted. *p.* 59. —*Rivers and salt water ditches.*

CLASS III. DICOTYLEDONS.

Embryo with 2 or more *cotyledons*. *Plumule* in the centre of their point of junction: the inferior end of the *embryo* itself elongated into a *radicle*, and not containing any secondary *radicles* in its substance.

Stem increasing by external layers or additions; with an evident distinction between bark and wood. *Leaves* usually veined, rarely nerved.

DIV. I. *Perianth, or floral covering, if any, single* (*calyx of Juss.*).

ORDER I. CONIFERÆ. *Juss.*

Flowers usually amentaceous, with the anthers and pistils in distinct flowers, mostly naked. *Barren fl.* 1—many-celled, sessile, on scale-like bracteæ, or on the axis of the amentum. *Fertile fl. Cupule* 1-flowered, almost closed, shaped like a pistil. *Perianth* adherent, membranous. *Ovary* 1. *Stigma* sessile, simple. *Nuts* 1-celled, 1-seeded, either solitary or by pairs within the unexpanded *cupule*, or covered by imbricated enlarged bracteæ or peduncles forming a *cone* (*strobilus*). *Seed* pendulous, albuminous. *Embryo* with two or many *cotyledons*. *Radicle* superior.

Monœcious or *diœcious trees*, generally abounding with resin. *Leaves* simple, acerose, opposite or whorled or fascicled. *Mirb.*

1. PINUS. *Decand.*

Monœcious. Barren fl. Aments (or *Catkins*) racemose, compact and terminal, scaly, the scales bearing stamens at the extremity. *Stam.* 2. *Anthers* 1-celled. *Fertile fl. Aments* simple, imbricated, the scales acuminated. *Ovaries* 2. *Stigmas* glandulose. Scales of the *cones* oblong, clavate, woody at the apex, umbilicated and angular. *Nuts* geminate, 1-seeded, covered with an appendiculated membrane. *Cotyledons* digitato-partite. *Leaves* binous, or many from the same sheath. *Decand.*

1. P. *sylvestris*, leaves in pairs rigid, cones conico-ovate acute as long as the leaves generally in pairs. *p.* 275.—*Woods.*

2. JUNIPERUS.

Diœcious, rarely *monœcious*. *Barren fl.* *Aments* ovate; the scales verticillate, peltato-pedicellate. *Anth.* 4—8, 1-celled. *Fertile fl.* *Aments* globose; scales 3, concave, coadunate. *Stigma* gaping. *Berry* with 3 bony 1-seeded *Nuts*, surrounded with the united and fleshy scales. *Decand.*

1. J. *communis*, leaves ternate patent mucronate longer than the berry, *p.* 290.—*Woods and moors.*

3. TAXUS.

Flowers diœcious or monœcious, surrounded with many scales. *Barren fl.* *Stam.* 8—10, their filaments monadelphous. *Anth.* peltate, 6—8 celled; *cells* dehiscent beneath. *Fertile fl.* *Style* 0. *Stigma* concave. *Drupe* fleshy, open at the extremity. *Nut* 1-seeded. *Decand.*

1. T. *baccata*, leaves approximate. *p.* 290.

ORDER II. CORYLACEÆ. *Mirb.*

(*Cupuliferæ* Rich.)

Flowers amentaceous, with the *anthers* and *pistils* in distinct flowers. *Barren fl.* *Perianth* sometimes wanting. *Stam.* 5—20 on each bractea or scale. *Fertile fl.* *Cupule* 1- or many-flowered. *Perianth* adherent, multidentate. *Ovary* single, many-celled, and with many ovules. *Style* 2—3 or many-cleft. *Nuts* 1 or more, by abortion 1-celled, 1-seeded. *Seed* pendulous. *Radicle* superior. *Albumen* none.

Shrubs or trees with alternate simple leaves and stipules. *Mirb.*

1. CORYLUS.

Monœcious. *Barren fl.* in a cylindrical catkin; its scales 3-cleft. *Perianth* 0. *Stam.* 8. *Anthers* 1-celled. *Fertile fl.* *Perianth* almost obsolete. *Ovaries* several, surrounded by a scaly involucre. *Stigmas* 2. *Nut* 1-seeded, surrounded at the base with the enlarged united coriaceous scales of the *involucre*, forming the *cupule*.

1. C. *Avellana*, stipules oblong obtuse, leaves roundish-cordate pointed, involucre of the fruit campanulate rather spreading torn at the margin. *p.* 275.—*Woods.*

2. QUERCUS.

Monœcious. *Barren fl.* in a lax catkin. *Perianth* single, somewhat 5-cleft. *Stam.* 5—10. *Fertile fl.* *Cupule* cup-shaped, scaly. *Perianth* 6-lobed. *Ovary* 3-celled, 2 of the cells abortive. *Style* 1. *Stigmas* 3. *Nut* (*acorn*) 1-celled, 1-seeded, surrounded at the base with the scaly cupule.

1. Q. *Robur*, leaves deciduous dilated towards the extremity obovato-oblong sinuated and lobed, their sinuses rather acute, their lobes obtuse, fruitstalks elongated. *p*. 273.—*Woods*.
2. Q. *sessiliflora*, leaves deciduous petiolate oblong sinuated and lobed, the sinuses rather acute, the lobes obtuse, fruit sessile, *p*. 273.—*Woods*.

3. CASTANEA.

Monœcious. *Barren fl*. in a very long cylindrical catkin. *Perianth* single, of 1 leaf, 6-cleft. *Stam*. 5—20. *Fertile fl*. 3, within a 5-lobed thickly muricated *involucre* or *cupule*. *Perianth* 5—6-lobed, having the rudiments of 12 *stam*. *Ovaries* 6-celled, with the cells 2-seeded, 5 of them mostly abortive. *Styles* 6. *Nut* 1—2-seeded, invested with the enlarged *involucre*.

1. C. *vulgaris*, leaves oblongo-lanceolate acuminate mucronato-serrate glabrous on each side. *p*. 273.—*Plantations*.

4. FAGUS.

Monœcious. *Barren fl*. in a globose catkin. *Perianth* campanulate, 6-cleft. *Stam*. 5—12. *Fertile fl*. within a four-lobed prickly *involucre* or *cupule*. *Perianth* with 4—5 minute lobes. *Ovaries* 3-celled, 2 of the cells becoming abortive. *Styles* 3. *Nuts* 1-seeded, invested with the enlarged *involucre*.

1. F. *sylvatica*, leaves ovate glabrous obsoletely dentate their margins ciliated. *p*. 274.—*Woods*.

5. CARPINUS.

Monœcious. *Barren fl*. in a cylindrical catkin; its scales roundish, ciliated at the base. *Stam*. 8—20. *Fertile fl*. in a lax catkin; its scales large, foliaceous, 3-lobed, 1-flowered. *Perianth* urceolate, adherent with the 2-celled *ovary*, of which 1 cell is abortive. *Styles* 2. *Nut* ovate, striated, 1-seeded.

1. C. *Betulus*, scales or bracteas of the fruit oblong serrated with 2 smaller lateral lobes. *p*. 274.—*Woods*.

ORDER III. SALICINÆ. *Mirb*.

Flowers amentaceous, with the *anthers* and *pistils* in distinct flowers. *Barren fl*. *Perianth* either none, or bearing the *stam*. *Stam*. 1—3. *Fertile fl*. *Perianth* simple, free and persistent, or none. *Ovary* 1. *Style* simple. *Stigmas* 2—4. *Ovules* pendulous. Fruit a *capsule* or *achenium*, 1—2-celled, 1—many-seeded. *Seeds* pendulous. *Albumen* none. *Radicle* superior.

Shrubs or *trees* with alternate simple leaves and stipules. *Mirb*.

1. SALIX.

Diœcious. *Barren fl*. Scales of the catkin single-flowered, imbricated, with a nectariferous gland at their base. *Perianth* 0.

Stam. 1—5. *Fertile fl.* *Scales* of the catkin single-flowered. *Perianth* 0. *Stigmas* 2, often cleft. *Caps.* 1-celled, 2-valved, many-seeded. *Seeds* comose.

* *Leaves serrated, smoothish, especially above.*

1. S. *purpurea,* monandrous decumbent, leaves lanceolate broadest upwards serrated glabrous, germens ovate very pubescent sessile, stigma nearly sessile. *p.* 277.—*Marshes.*
2. S. *Helix,* monandrous erect, leaves lanceolate broadest upwards serrated glabrous, germens oblongo-ovate very pubescent sessile, style short, stigma small 2-lobed. *p.* 278.—*Marshes.*
3. S. *Lambertiana,* monandrous erect, leaves lanceolate broadest upwards serrated glabrous, germens shortly ovate very pubescent sessile, stigma nearly sessile. *p.* 278.—*Marshes.*
4. S. *rubra,* stam. 2 united at the base, leaves linear-lanceolate serrated glabrous green on both sides, capsules oblongo-ovate very pubescent sessile, style elongated, stigmas rarely 2-lobed linear. *p.* 278.—*Osier-grounds.*
5. S. *Croweana,* " monadelphous, leaves elliptical" (obovato-elliptical acute) " subserrated quite glabrous glaucous beneath." *p.* 278.—*Marshes.*
6. S. *triandra,* leaves oblongo-lanceolate acute serrated glabrous, germens pedicellate oblongo-ovate glabrous as well as the scale, stigmas sessile bifid. *p.* 278.—*Marshes.*
7. S. *lanceolata,* triandrous, leaves lanceolate acuminate serrated glabrous, germens pedicellate oblongo-ovate glabrous, style elongated, stigmas bifid, scales very villous. *p.* 278.—*Marshes.*
8. S. *amygdalina,* triandrous, leaves oblongo-lanceolate acute serrated glabrous, germens pedicellate ovate glabrous, stigmas sessile bifid, scales glabrous or a little pubescent at the base. *p.* 279.—*Marshes.*
9. S. *decipiens,* " leaves lanceolate serrated very glabrous, petioles subglandular, germens attenuated pedicellated, branches smooth and highly polished." *p.* 279.—*Woods.*
10. S. *Russelliana,* leaves lanceolate tapering at each extremity strongly serrated glabrous, germens pedicellate oblongo-subulate glabrous, style elongate, stigmas bifid, scales lanceolate very narrow slightly ciliated or pubescent. *p.* 279.—*Marshes,*
11. S. *fragilis,* leaves ovato-lanceolate acute serrated glabrous, germens shortly pedicellate oblongo-ovate glabrous, style elongated, stigmas bifid, scales pubescent and much ciliated, *p.* 279.—*Marshes.*
12. S. *pentandra,* pentandrous, leaves obovato-elliptical shortly acuminate glanduloso-serrated glabrous, germens oblongo-ovate glabrous nearly sessile, style elongated, stigmas bifid, scale almost as long as the germen glabrous or slightly pilose. *p.* 279. —*River-banks.*

13. S. *nigricans*, leaves mostly obovate acute crenato-serrate glaucous and often downy beneath, germens pedicellate lanceolato-subulate very silky, styles elongated, stigmas mostly entire, scales villous. *p.* 280.—*Marshes.*

14. S. *bicolor*, "leaves elliptical acute denticulato-serrate smoothish glaucous beneath, germens pedicellate lanceolate silky." *p.* 280.—*Woods.*

15. S. *petiolaris*, leaves lanceolate serrated glabrous glaucous and often silky beneath, germens pedicellate ovate silky, stigmas sessile 2-lobed. *p.* 280.—*Marshes.*

16. S. *radicans*, leaves obovato- or elliptico-lanceolate with often wavy serratures glabrous glaucous beneath, germens lanceolate pedicellate very silky as well as the scales, style elongated, stigmas entire or bifid. *p.* 280.—*River-banks.*

17. S. *phylicifolia*, leaves oblong shortly attenuated at each extremity with often wavy serratures glabrous and glaucous beneath, germens pedicellate subulate glabrous, style much elongated, stigmas bifid. *p.* 281.—*Mountains.*

18. S. *Arbuscula*, leaves lanceolate obsoletely denticulato-serrate glabrous glaucous beneath, germens oblongo-ovate very silky pedicellate, style elongated, stigmas entire. *p.* 281.—*Alps.*

19. S. *livida*, "leaves oblong nearly entire glabrous livid beneath, germens pedicellate somewhat silky, stigmas nearly sessile 2-lobed." *p.* 281.—*Mountains.*

20. S. *vitellina*, leaves lanceolate with cartilaginous serratures glabrous above more or less silky beneath, germens lanceolate sessile glabrous, style short, stigmas bipartite, scales lanceolate as long as the germen glabrous. *p.* 281.—*Marshes.*

21. S. *tenuifolia*, "leaves elliptical acute serrated smoothish glaucous beneath, stipules obsolete, capsules very smooth." *p.* 282.—*Mountains.*

22. S. *myrsinites*, leaves oval serrated veined shining quite glabrous, germens nearly sessile lanceolate slightly downy, style elongated, stigmas bifid. *p.* 282.—*Alps.*

23. S. *prunifolia*, leaves ovate serrated more or less veiny glabrous glaucous beneath, germens sessile oblongo-ovate extremely silky, style short, stigmas notched. *p.* 282.—*Alps.*

24. S. *carinata*, leaves ovate serrated glabrous glaucous beneath frequently folded so as to form a keel, germens sessile oblongo-ovate extremely silky, style short, stigmas notched. *p.* 282 —*Alps.*

25. S. *Dicksoniana*, "leaves elliptical acute slightly toothed glabrous glaucous beneath, young branches very glabrous, catkins ovate short erect silky." *p.* 282.—*Alps.*

26. S. *herbacea*, leaves orbicular serrated glabrous shining veined, germens sessile lanceolate glabrous, stigmas sessile bifid, catkins of few flowers. *p.* 283.—*Alps.*

** *Leaves subentire, more or less hairy or silky.*

27. S. *reticulata*, leaves nearly elliptical-orbicular mostly glabrous remarkably reticulated with veins glaucous beneath, germens sessile oblongo-ovate downy, style short, stigmas bifid. *p.* 283.—*Alps.*

28. S. *arenaria*, leaves oblongo-lanceolate entire downy especially beneath, germens sessile lanceolate downy with a very long style, stigmas linear often entire. *p.* 283.—*Alps.*

29. S. *glauca*, leaves ovato-lanceolate entire downy white and very silky beneath, germens sessile narrow-elliptical ovate very downy, stigmas nearly sessile bifid. *p.* 283.—*Alps.*

30. S. *repens*, monadelphous, leaves elliptical-lanceolate acute entire somewhat downy glaucous and generally very silky beneath, germens upon a long footstalk lanceolate very silky, styles short, stigmas bifid, stems more or less procumbent. *p.* 284.—*Heaths.*

31. S. *cinerea*, leaves obovato-elliptical approaching to lanceolate generally slightly downy above, beneath pubescent and reticulated with veins glaucous, the margins slightly recurved, stipules semicordate, germens pedicellate lanceolate subulate silky, style short, stigmas mostly entire. *p.* 284.—*Woods.*

32. S. *aurita*, leaves obovate repando-dentate rugose with veins more or less pubescent very downy beneath their margins recurved tipped with a small recurved point, stipules roundish semicordate, germens lanceolato-subulate pedicellate silky, style very short, stigmas generally entire. *p.* 285.—*Woods.*

33. S. *rupestris*, leaves obovate approaching to lanceolate subserrated pubescent and subsilky beneath veined, stipules small semicordate, "germens pedicellate lanceolato-subulate, style short, stigmas mostly entire." *p.* 285.—*Alps.*

34. S. *Andersoniana*, leaves elliptical-oblong acute faintly crenato-dentate the upper ones chiefly subpubescent all glaucous beneath, stipules small subovate, branches minutely downy, germens pedicellate linear subulate glabrous, style elongated, stigmas bifid, scales fringed with a few long silky hairs. *p.* 285.—*Mountains.*

35. S. *Forsteriana*, "leaves elliptical-obovate acute notched slightly downy glaucous beneath, stipules vaulted, branches minutely downy, germen stalked silky, stigmas undivided. *p.* 285.—*Bushy places.*

36. S. *cotinifolia*, leaves elliptical-orbicular obsoletely dentate slightly pubescent above more so and veiny beneath, germens slightly silky pedicellate, style elongated, stigmas bifid. *p.* 286. —*Bushy places.*

37. S. *sphacelata*, "leaves entire elliptical plane pubescent on both sides, somewhat withered at the point, stipules obsolete, capsules subulate." *p.* 286.—*Alps.*

38. S. *caprea*, leaves ovato-elliptical acute serrated and undulated at the margin downy beneath, stipules semicordate, germens pedicellate lanceolato-subulate silky, stigmas sessile undivided. *p.* 286.—*Woods.*

39. S. *acuminata*, " leaves lanceolato-oblong pointed waved slightly toothed downy beneath, stipules kidney-shaped, capsules ovate tapering." *p.* 286.—*Moist woods.*

40. S. *stipularis*, leaves lanceolate very indistinctly crenate white and downy beneath, stipules large semicordate acute, " germens shortly pedicellate ovate downy, style a little elongated, stigmas long awl-shaped recurved entire, nectary cylindrical." *p.* 286.—*Willow-grounds.*

41. S. *mollissima*, leaves lanceolate obscurely crenate white and covered with silky pubescence beneath, stipules rather small semicordate acute, germens lanceolato-subulate very silky shortly pedicellate, style elongated, stigmas long linear mostly entire. *p.* 287.—*Willow-grounds.*

42. S. *viminalis*, leaves linear lanceolate obscurely crenate white and silky beneath, stipules very small sublanceolate, branches straight and twiggy, germens upon very short footstalks silky lanceolato-subulate, style elongated, stigmas long linear mostly entire.—*p.* 287.—*Willow-grounds, &c.*

43. S. *alba*, leaves elliptical lanceolate regularly glanduloso-serrate acute silky beneath often so above, germens ovato-acuminate nearly sessile glabrous, stigmas nearly sessile short recurved bifid, scales short pubescent at the margin. *p.* 287.—*Meadows and hedges.*

2. POPULUS.

Diœcious. *Catkins* cylindrical; scales lacerated. *Barren Fl.* *Anth.* 8—30 arising from a turbinate, oblique, entire, single perianth. *Fertile Fl.* *Perianth* turbinate (entire)? *Stigmas* 4. *Caps.* superior, 2-celled, 2-valved, many-seeded. *Seeds* comose.

1. P. *alba*, leaves roundish cordate lobed toothed glabrous above downy and very white beneath, fertile catkins ovate, stigmas 4. *p.* 288.—*Plantations.*

2. P. *tremula*, leaves nearly orbicular broadly toothed glabrous on both sides, petioles compressed, " stigmas 4, auricled at the base." *Sm.* *p.* 289.—*Moist woods.*

3. P. *nigra*, leaves deltoid acute serrated glabrous on both sides, fertile catkins cylindrical lax, " stigmas 4." *Sm.* *p.* 289.—*Plantations.*

3. ALNUS.

Monœcious. *Barren Fl.* with long cylindrical *catkins;* their scales 3-lobed, 3-flowered. *Perianth* 4-partite. *Stam.* 4. *Fertile Fl.* with ovate *catkins*; their scales subtrifid with 2 flowers. *Perianth* 0. *Styles* 2. *Fruit* a *Nut*, compressed.

1. A. *glutinosa,* leaves roundish cuneiform obtuse lobed at the margin and serrated somewhat glutinous downy in the axils of the leaves beneath. *p.* 271.—*Bogs.*

4. BETULA.

Monœcious. *Catkins* cylindrical. *Barren Fl.* ternate upon the scale. *Perianth* 0. *Stam.* 8—10. *Fertile Fl.* *Scale* of the catkin imperfectly 3-lobed, 3-flowered. *Perianth* 0. *Styles* 2. *Ovaries* compressed, 2-celled, 1 abortive. *Nuts* compressed, with a membranaceous margin, 1-seeded.

1. B. *alba,* leaves ovato-deltoid acute doubly serrated glabrous. *p.* 274.—*Woods.*
2. B. *nana,* leaves orbicular crenate. *p.* 274.—*Alpine bogs.*

5. MYRICA [*].

Diœcious. *Catkins* ovate, their scales lunulate. *Barren Fl.* *Stam.* 4—6. *Anthers* 4-valved. *Fertile Fl.* *Ovary* 1. *Stigmas* 2. *Drupe* 1-celled, 1-seeded. *Decand.*

1. M. *Gale,* leaves lanceolate broader upwards serrated, stem shrubby. *p.* 288.—*Marshes and wet moors.*

ORDER IV. ULMACEÆ. *Mirbel.*

Flowers perfect, or imperfect by abortion. *Perianth* single, bearing the stam., free, 4—6-toothed. *Stam.* 4—6. *Ovary* 1. *Styles* 2. *Stigmas* double. *Achenium* or *Drupe* 1 seeded. *Seed* pendulous, with or without *albumen.* *Embryo* straight or rolled up. *Radicle* superior.

Trees or *Shrubs* . *Leaves* simple, rough, alternate, with stipules. *Flowers* axillary. *Mirbel.*

1. ULMUS.

Perianth persistent, 4—6-cleft. *Fruit* membranous, compressed, 1-seeded.

1. U. *campestris,* leaves doubly serrated scabrous unequal at the base, flowers nearly sessile 4-cleft, with 4 stam., fruit oblong naked. *p.* 85.—*Woods and hedges.*
2. U. *glabra,* leaves doubly serrated smooth unequal at the base, flowers nearly sessile 5-cleft, fruit obovate naked cloven. *p.* 85.—*Woods and hedges.*
3. U. *montana,* leaves doubly serrated pointed rough unequal at the base, flowers on short stalks effuse 5—6-cleft with 5—6 stam., fruit roundish naked. *p.* 85.—*Woods.*

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[*] This genus is considered the type of the order *Myriceæ* by M. Richard.

ORDER V. URTICEÆ.

Flowers perfect, or with the *anthers* and *pistils* distinct. *Perianth* free, 3—5-cleft, persistent. *Stam.* 3—5, hypogynous, usually with an elastic filament. *Ovary* 1. *Style* simple or double or none. *Stigma* simple or double. *Achenia,* or little *Drupes,* covered with the persistent *perianth,* solitary or united on a dilated fleshy receptacle. *Seeds* pendulous, with or without *albumen.* *Embryo* straight, curved or spiral. *Radicle* superior.

Stems herbaceous or woody. *Leaves* alternate or opposite, generally with stipules. *Flowers* either in heads or racemes. *Mirb.*

1. URTICA.

Monœcious or *diœcious.* *Barren Fl.* *Perianth* of 4 leaves, containing the cup-shaped rudiments of a germen. *Fertile Fl.* *Perianth* of 2 leaves. *Achenium* 1-seeded, shining.

1. U. *urens,* leaves opposite elliptical with about 5 ribs, clusters of flowers nearly simple. *p.* 271.—*Waste places.*

2. U. *dioica,* leaves ovate acuminate cordate at the base, clusters of flowers much branched in pairs mostly diœcious. *p.* 271. —*Hedges.*

2. PARIETARIA.

Flowers often imperfect, surrounded by a many-cleft involucrum. *Perianth* 4-cleft. *Stam.* 4. *Filaments* at first incurved, then expanding with an elastic force. *Ovary* 1. *Style* 1. *Achenium* 1-seeded, inclosed in the enlarged *perianth.*

1. P. *officinalis,* leaves ovato-lanceolate, involucre of many ovate leaflets. *p.* 56.—*Walls.*

3. HUMULUS.

Diœcious. *Barren Fl.* *Perianth* single, 5-partite. *Stam.* 5. *Anthers* with 2 pores at the extremity. *Fertile Fl.* amentaceous. *Scales* of the catkin large, persistent, concave, entire, single-flowered. *Perianth* 0. *Styles* 2. *Seed* 1.

1. H. *Lupulus.* *p.* 288.—*Hedges.*

ORDER VI. ARISTOLOCHIÆ.

Perianth of 1 piece, adherent. *Stam.* definite, epigynous. *Style* simple, very short. *Stigma* many-lobed in a radiating manner. *Ovary* many-celled. *Cells* many-seeded. *Capsule* dry or berried. *Seeds* very numerous. *Embryo* very minute, entire, at the base of the corneous *albumen.* *Mirb.* *Br.*

1. ASARUM.

Perianth 3-cleft. *Stam.* 12, placed upon the *ovary*. *Anthers* adnate with the middle of the filaments. *Capsule* 6-celled.

1. A. *europæum*, leaves binate reniform obtuse. *p.* 146.—*Woods, rare.*

Order VII. EUPHORBIACEÆ. *Juss.*

Anthers and *Pistils* in distinct flowers, naked, or with a free 3- or more cleft *perianth*. *Barren Fl. Stam* 1—12. *Anthers* didymous. *Fertile Fl. Ovary* 1. *Styles* 2—3. *Stigmas* 2—3, bipartite or 2-lobed. *Capsule* elastically splitting into 2—3 one- or two-seeded *Cocci*. *Seeds* suspended. *Embryo* in the axis of a fleshy *albumen*. *Radicle* superior. *Cotyledons* flat.

Stems herbaceous or woody. *Leaves* alternate opposite or whorled.

1. MERCURIALIS.

Diœcious. *Perianth* tripartite. *Barren Fl. Stam.* 9—12. *Fertile Fl. Styles* 2.

1. M. *annua*, stems branched, leaves glabrous, flowers spicato-glomerate. *p.* 290.—*Woods.*
2. M. *perennis*, stem quite simple, leaves rough, flowers upon long footstalks. *p.* 289.—*Waste places.*

2. EUPHORBIA.

Monœcious, rarely furnished with a *perianth*. *Involucre* monophyllous, calyciform, inclosing a number of pedicellated *flowers*, of which one is pistilliferous, the rest consisting each of one *stamen*.

1. E. *Peplus*, umbel of 3 forked rays, bracteas ovate and as well as the obovate shortly petiolated leaves entire, nectaries crescent-shaped horned. *p.* 148.—*Waste places.*
2. E. *exigua*, umbel of 3 forked rays, bracteas lanceolate and as well as the linear-lanceolate leaves entire. *p.* 148.—*Corn-fields.*
3. E. *helioscopia*, umbel of 5 forked rays, bracteas obovate and as well as the cuneate leaves serrated. *p.* 148.—*Corn-fields.*
4. E. *Esula*, umbel of many forked rays, bracteas somewhat heart-shaped and as well as the linear obovate leaves entire. *p.* 148.—*Woods.*
5. E. *Cyparissias*, umbel of many forked rays, bracteas broadly

cordate and as well as the linear mucronated leaves entire. *p.* 148.—*Woods.*

ORDER VIII. RESEDACEÆ. *Decand.*[a]

Flowers sterile and perfect, in heads. *Perianth* scutelliform, oblique. *Stam.* definite, perigynous. *Anthers* oblong, innate. *Ovary* 1-celled, 3-lobed, with three parietal many-seeded *receptacles.* *Stigma* 1 to each lobe, simple, sessile. *Capsule* open at the summit, 1-celled, many-seeded. *Seeds* suspended, reniform. *Embryo* curved, without *albumen.* *Radicle* superior.

Stems herbaceous, rough with little minute transparent papillæ. *Leaves* mostly compound, alternate, without stipules. *Flowers* with an *involucre.*

1. RESEDA.

Flowers capitate. External *florets* sterile, the central one perfect.

1. R. *Luteola,* leaves lanceolate entire plane. *p.* 147.—*Waste places.*
2. R. *lutea,* leaves pinnated, upper ones with 3 segments. *p.* 147. —*Waste places.*

ORDER IX. THYMELEÆ.

Perianth free, tubular, persistent, often coloured. *Stam.* 8, in two rows, included in the perianth; 4 opposite the segments and 4 alternate with them. *Style* simple, inserted beneath the apex of the ovary. *Stigma* simple. *Drupe* or *Achenium* 1-seeded. *Seed* pendulous. *Embryo* surrounded by a small quantity of albumen. *Radicle* superior. *Cotyledons* fleshy.

Shrubs with simple, entire, alternate leaves. *Flowers* solitary or aggregate, terminal or axillary. *Mirb.*

1. DAPHNE.

Perianth tubular, 4-lobed. *Stam.* 8. *Style* short. *Berry* 1-celled, 1-seeded.

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[a] In adopting the order *Resedaceæ* of M. Decandolle, we have taken an entirely new view of the structure of the very curious plants of which it is composed. It would occupy more space than we can at present spare to explain all the motives by which we have been influenced. But we are sure that in point of affinity it will be evident to any one that it approaches *Euphorbiaceæ* much more nearly than either *Droseraceæ* or *Capparideæ,* to which it appears to us to have no sort of resemblance; except indeed in its parietal mode of placentation. *Ochradenus* of Delile is the only other genus of the order with which we are acquainted.

1. D. *Laureola*, racemes axillary of about 5 flowers, leaves lanceolate glabrous evergreen. *p.* 119.—*Woods.*

ORDER X. POLYGONEÆ.

Perianth free, 4—6-cleft, often coloured, persistent. *Stam.* definite, hypogynous, or nearly so. *Anth.* bursting longitudinally. *Style* 2—4-partite. *Stigmas* simple. *Achenium* or *Nut* 1-seeded. *Seed* erect. *Embryo* straight or bent, on one side of the farinaceous *albumen*. *Radicle* superior. twards, *Herbs* or rarely *Shrubs*. *Leaves* when young rolled ouspiked. alternate, sheathing at their base. *Flowers* panicled or *Mirb. Br.*

1. POLYGONUM.

Perianth 4—6-partite, coloured, persistent. *Stam.* 5—9, often 8. *Styles* 2—3. *Achenium* or small *Nut* often triangular.

* *Leaves ovate or lanceolate.*

† *Spikes of flowers terminal. Nut triquetrous.* (Bistorta.)

1. P. *Bistorta*, stem simple bearing one spike, leaves ovate waved, the radical ones running down into a footstalk. *p.* 120.—*Meadows.*
2. P. *viviparum*, stem simple bearing one spike, leaves linear-lanceolate, the lower ones elliptical petiolate their margins revolute. *p.* 120.—*Mountains.*

†† *Flowers spiked, terminal, or axillary. Nuts ovate.* (Persicaria.)

3. P. *amphibium*, flowers pentandrous, styles forked, spike oblongo-ovate, leaves petiolate cordato-lanceolate rough at the margins.—*α. aquaticum; β. terrestre. p.* 121.—*Lakes and their margins.*
4. P. *Persicaria*, flowers hexandrous, styles forked, leaves lanceolate (often spotted), spikes oblong erect their peduncle smooth, stipules fringed. p. 121.—*Waste places.*
5. P. *lapathifolium*, flowers hexandrous with 2 distinct styles, leaves ovato-lanceolate shortly petiolate, spikes oblong erect their peduncle rough, stipules not fringed. *p.* 121.—*Fields.*
6. P. *Hydropiper*, flowers hexandrous, styles forked, leaves lanceolate waved and spotless, spikes lax filiform drooping, stem erect. *p.* 121.—*Margins of lakes.*
7. P. *minus*, flowers hexandrous, style undivided, leaves linear-lanceolate plane very shortly petiolate, spikes slender erect, stem rooting at the base. *p.* 121.—*Moist fields, rare.*

††† *Flowers axillary.* (Polygonum.)

8. P. *aviculare*, flowers axillary, leaves elliptico-lanceolate rough

at the margin, nerves of the stipules distant, stem procumbent herbaceous. *p.* 122.—*Way-sides.*

** *Leaves cordate.* (Fagopyrum.)

9. P. *Fagopyrum*, leaves cordato-sagittate, stem nearly upright without prickles, angles of the fruit even. *p.* 122.—*Fields.*
10. P. *Convolvulus*, leaves cordato-sagittate, stem twining angular, segments of the perianth bluntly keeled. *p.* 122.—*Fields.*

2. RUMEX.

Perianth of 6 *leaves. Stam.* 6. *Styles* 3. *Nut* triquetrous, covered by the 3 interior valviform *leaves* of the *perianth.*

* *Flowers all perfect; valves graniferous.* (Lapatha.)

† *Valves entire.*

1. R. *aquaticus*, valves ovate entire bearing small grains, leaves lanceolate acute, the lower ones cordate at the base. *p.* 112. —*River sides.*
2. R. *crispus*, valves very large cordate entire reticulated bearing grains, leaves lanceolate waved acute. *p.* 112.—*Way-sides.*
3. R. *sanguineus*, valves oblong (small) entire, one at least bearing a grain, leaves lanceolate somewhat heart-shaped. *p.* 112. —*Woods.*

†† *Valves toothed.*

4. R. *acutus*, valves oblong somewhat toothed all bearing grains, leaves cordato-oblong acuminate, whorls leafy. *p.* 112.—*Pastures.*
5. R. *pulcher*, valves oblong toothed one of them principally bearing a grain, radical leaves panduriform, stem smooth diffuse. *p.* 113.—*Way-sides.*
6. R. *obtusifolius*, valves ovate toothed one principally bearing a grain, radical leaves ovato-cordate obtuse, stem roughish. *p.* 113.—*Way-sides.*
7. R. *maritimus*, valves deltoid fringed with setaceous teeth bearing grains, leaves linear, whorls much crowded. *p.* 113. —*Salt marshes.*
8. R. *palustris*, valves lanceolate with short setaceous teeth near the base bearing grains, leaves linear-lanceolate, whorls distant. *p.* 113.—*Marshes.*

** *Flowers polygamous; valves graniferous.*

9. R. *alpinus*, flowers polygamous, valves 1—2 graniferous, leaves ovato-cordate obtuse wrinkled. *Decand.*—*Mountains, rare*[a].

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[a] This species, I am recently informed by Mr. Maughan, has been found truly wild by *Mr. G. Don* on the Ochill-hills, Clackmannanshire, far from any cultivated ground.

*** *Flowers diœcious; valves grainless.* (Acetosa.)

10. R. *Acetosa*, leaves oblongo-sagittate their segments bent towards the petiole. *p.* 113.—*Pastures.*

11. R. *Acetosella*, leaves lanceolato-hastate their acute lobes spreading or even recurved. *p.* 113.—*Dry pastures.*

3. OXYRIA.

Perianth of 4 leaves, two inner ones longer. *Stam.* 6. *Styles* 2. *Nut* triquetrous, with a broad, winged, membranous *margin.* *Embryo* erect, inverted.

1. O. *reniformis.* *p.* 111[a].—*Moist alpine rocks.*

ORDER XI. CHENOPODEÆ, *Decand.* (*Atriplices, Juss.*)

Perianth of 1 piece, free, persistent, mostly with deep divisions, and with an imbricated æstivation. *Stam.* definite, opposite the segments, into the base of which they are inserted. *Style* 2—4-cleft, or none. *Stigmas* simple. *Achenium* or *Utriculus* inclosed by the persistent *perianth.* *Seeds* erect. *Embryo* curved round a farinaceous *albumen*, or spiral; rarely without *albumen.* *Panicle* inferior.

Herbs or *Shrubs.* *Leaves* simple, alternate, without stipules. *Flowers* generally perfect. *Br.*

1. CHENOPODIUM.

Flowers perfect. *Perianth* 5-cleft, closing upon but not wholly enveloping the *fruit.* *Stam.* 5. *Styles* 2.

* *Leaves semicylindrical, fleshy.*

1. Ch. *maritimum*, leaves glabrous subulate semicylindrical fleshy, flowers clustered axillary sessile. *p.* 83.—*Sea-coast.*

** *Leaves plane, undivided, and entire.*

2. Ch. *olidum*, leaves ovato-rhomboid entire, flowers in dense clustered spikes, stem diffuse. *p.* 83.—*Waste places.*

3. Ch. *polyspermum*, leaves ovate entire, racemes subcymose divaricate leafless, stem decumbent or erect. *p.* 83.—*Waste places.*

*** *Leaves plane, toothed, or lobed.*

4. Ch. *Bonus Henricus*, leaves triangular arrow-shaped entire, spikes compound terminal and axillary erect leafless.—*p.* 83.—*Way-sides.*

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[a] By mistake, in the first part of this work, this species is said to be *Donia sapida* of Brown, instead of *D. acida.*

5. Ch. *urbicum*, leaves triangular toothed, racemes long erect approaching the stem subsimple nearly leafless. *p*. 84.—*Waste places*.
6. Ch. *rubrum*, leaves rhomboido-triangular deeply toothed and sinuated, racemes erect compound leafy. *p*. 84.—*Dunghills, &c.*
7. Ch. *murale*, leaves ovate approaching to rhomboid acute toothed shining, racemes much branched subcymose leafless. *p*. 84.—*Under walls, &c.*
8. Ch. *hybridum*, leaves cordate angulato-dentate acuminate, clusters very much branched subcymose divaricated leafless. *p*. 84.—*Waste places*.
9. Ch. *album*, leaves ovate inclining to rhomboid entire at the base, upper ones oblong perfectly entire, racemes branched somewhat leafy, fruit smooth. *p*. 84.—*Waste places*.

2. ATRIPLEX.

Flowers polygamous. *Perfect fl. Perianth* single, 5-partite. *Stam*. 5. *Style* 2-partite. *Fruit* depressed, covered by the calyx. *Female fl. Perianth* 2-partite. *Stam*. 0.

1. A. *portulacoides*, stem shrubby, leaves obovato-lanceolate entire silvery white. *p*. 291.—*Muddy places*.
2. A. *laciniata*, stem herbaceous diffuse, leaves ovato-deltoid dentato-sinuate very mealy beneath. *p*. 291.—*Sea-shores*.
3. A. *patula*, stem herbaceous spreading, leaves triangular hastate glabrous above, irregularly toothed the upper ones entire, perianth of the fruit more or less tuberculated at the sides. *p*. 291.—*Waste places*.
4. A. *angustifolia*, "stem herbaceous spreading, leaves lanceolate entire the lower ones somewhat hastate, cal. of the fruit hastate slightly tuberculated at the sides." *Sm*. *p*. 291.—*Waste places and dunghills*.
5. A. *littoralis*, stem herbaceous erect, leaves all linear entire or toothed, perianth of the fruit sinuated and muricated on the back. *p*. 291.—*Sea-shore*.

3. BETA.

Flowers perfect. *Perianth* half-adherent, 5-partite. *Stam*. 5. *Styles* 2. *Achenium* subreniform, imbedded in the fleshy enlarged *base* of the *perianth*.

1. B. *maritima*, stems procumbent at the base, flowers solitary or in pairs, segments of the perianth entire. *p*. 84.—*Sea-shore*.

4. SALSOLA.

Flower perfect. *Perianth* 5-cleft, persistent, enveloping the *fruit* with its *base*, and crowning it with its enlarged scariose *limb*. *Stam*. 5. *Styles* 2. *Embryo* spiral.

1. S. *Kali*, stem herbaceous prostrate, leaves subulate spinous scabrous, segments of the perianth margined scariose. *p.* 85. —*Sea-shores.*

5. SALICORNIA.

Perianth single, turbinate, fleshy, closed. *Stam.* 1—2. *Style* bi-trifid. *Utricle* included in the enlarged *perianth.*

1. S. *herbacea*, stem herbaceous (annual) erect, articulations compressed and somewhat thickened upwards notched, spikes cylindrical slightly tapering at the extremity. *p.* 1.—*Salt marshes.*
2. S. *radicans*, stem woody (perennial) procumbent and rooting, articulations cylindrical spreading and notched at the top, spikes oblong obtuse. *p.* 1.—*Salt marshes.*

ORDER XII. PLANTAGINEÆ. *Juss.*

Flowers perfect, rarely monœcious. *Cal.?* 4-partite, persistent (3-cleft in *Littorella*). *Cor.?* monopetalous, tubular, hypogynous, scariose, persistent, 4-cleft (urceolate and almost entire in *Littorella*). *Stam.* 4, inserted into the *tube*, and alternate with the *segments* of the *Cor. Filaments* flaccid. *Anth.* versatile. *Ovary* without a surrounding *disk. Style* simple, slender. *Stigma* simple or bifid. *Pyxis* membranous, 2—4-celled. *Seeds* definite or indefinite, attached by their middle. *Testa* mucilaginous. *Embryo* transverse, in the axis of a cartilaginous *albumen. Radicle* inferior.

Herbs with or without a stem. *Leaves* mostly radical in tufts, often many-nerved. *Flowers* spiked, rarely solitary.

1. PLANTAGO.

Flowers perfect. *Capsule* 2—4-celled. *Seeds* definite or indefinite.

* *Dissepiment of the capsule plane, each cell many-seeded.*

1. Pl. *major*, leaves broadly ovate mostly on longish footstalks, scape rounded, spikes long cylindrical. *p.* 53.—*Pastures.*

** *Dissepiment of the capsule plane, each cell one-seeded.*

2. Pl. *media*, leaves ovate mostly with very short footstalks, scape rounded, spike cylindrical. *p.* 53.—*Pastures.*
3. Pl. *lanceolata*, leaves lanceolate, scape angular, spike ovate. *p.* 54.—*Meadows and pastures.*
4. Pl. *maritima*, leaves linear grooved fleshy woolly at the base, scape rounded, spike cylindrical. *p.* 54.—*Sea-coast.*

*** *Dissepiment with 4 angles (thus forming 4 cells), seed in each cell.*

5. Pl. *Coronopus*, leaves linear pinnatifid, scape rounded. *p.* 54. —*Gravelly places.*

2. LITTORELLA.

Monœcious. Barren fl. Cal. 4-partite. *Cor.* tubular, 4-fid. *Fertile fl. Cal.* 0, unless 3 bracteæ (?) can be so called. *Cor.*

urceolate with the contracted mouth subtridentate. *Style* very long. "*Caps.* transversely opening." *Juss.*

1. L. *lacustris. p.* 271.—*Margins of lakes.*

DIV. II. *Perianth or floral Covering double. Calyx and Corolla.*

SECT. I. *Corolla monopetalous, hypogynous (or not attached to the calyx).*

ORDER XIII. PLUMBAGINEÆ. *Juss.*

Calyx tubular, plaited, persistent. *Cor.* monopet. equal, or (rarely) pentapetalous. *Stamens* definite, hypogynous in the monopetalous genera, epipetalous in the polypetalous ones. *Ovary* 1, superior, 1-seeded. *Ovule* pendulous from the end of a seed-stalk arising from the base of the ovary. *Styles* 5, rarely 3—4. *Stigmas* the same number. *Utriculus* generally closed. *Seed* pendulous. *Testa* simple. *Embryo* straight. *Radicle* superior.

Herbs or *Undershrubs. Leaves* alternate or scattered, undivided, somewhat sheathing at the base. *Flowers* in spikes or heads. *Br.*

1. STATICE.

Cal. infundibuliform, plaited, scariose. *Pet.* 5, persistent. *Stam.* 5, inserted on the petals. *Styles* 5. *Pericarp* indehiscent.

1. S. *Armeria*, leaves linear, scape simple bearing a round head of flowers. *p.* 97.—*Sea-shores and highest mountains.*
2. S. *Limonium*, scape panicled rounded branched, leaves glabrous ovato-lanceolate undulate obtuse nerveless tipped with a small point. *p.* 97.—*Salt-marshes.*
3. S. *reticulata*, scape repeatedly dichotomous zigzag, the lower branches sterile, leaves spathulate acute glabrous. *p.* 97.—*Sea-side, rare.*

ORDER XIV. PRIMULACEÆ. (*Lysimachiæ Juss.* *Anagallideæ Rich.*)

Calyx regular, persistent, divided. *Cor.* monopetalous, hypogynous, regular. *Stam.* inserted into the corolla, opposite the segments of its limb and equal to them in number. *Ovary* 1, tubular. *Style* 1. *Stigma* capitate. *Caps.* with a central free receptacle. *Seeds* numerous, peltate. *Embryo* transverse, surrounded by albumen.

Herbs. Leaves usually opposite, sometimes whorled and scattered. *Br.*

1. ANAGALLIS.

Cal. 5-partite. *Cor.* rotate, 5-lobed. *Stam.* 5, hairy. *Caps.* bursting all round transversely.

1. A. *arvensis*, leaves ovate sessile dotted beneath, cor. broadly and very obtusely crenate piloso-glandulose. *p.* 72.—*Fields.*
2. A. *cærulea*, leaves ovate sessile dotted beneath, cor. dentate scarcely at all glandulose. *p.* 73.—*Fields.*
3. A. *tenella*, stem creeping filiform, leaves ovate or roundish petiolate. *p.* 73.—*Bogs.*

2. LYSIMACHIA.

Cal. 5-partite. *Cor.* 5-fid, rotate. *Stam.* 5. *Caps.* globose, ten-valved.

* *Peduncles many-flowered.*

1. L. *vulgaris*, leaves ovato-lanceolate opposite ter- or quaternate, panicle terminal. *p.* 72.—*Marshes.*
2. L. *thyrsiflora*, leaves opposite lanceolate, racemes pedunculate lateral. *p.* 72.—*Marshes, rare.*

** *Peduncles* 1-*flowered.*

3. L. *nemorum*, leaves ovate acute, stem creeping, peduncles solitary, calycine segments linear-subulate, stam. smooth. *p.* 72. —*Woods.*
4. L. *Nummularia*, leaves subcordate obtuse, stem procumbent, peduncles solitary, calycine segments ovate acute, stam. glandular. *p.* 72.—*Banks.*

3. PRIMULA.

Calyx 5-toothed. *Cor.* hypocrateriform, the *tube* cylindrical, its orifice naked. *Stam.* 5, not exserted. *Stigma* globose. *Caps.* opening with 10 teeth.

1. Pr. *vulgaris*, leaves dentate rugose, scape 1-flowered, limb of the cor. plane. *p.* 71.—*Woods.*
2. Pr. *elatior*, leaves dentate rugose contracted below the middle, scape umbellate, limb of the cor. plane. *p.* 71.—*Woods.*
3. Pr. *Veris*, leaves dentate rugose contracted below the middle, scape umbellate, flowers drooping, limb of the cor. concave. *p.* 71.—*Pastures.*
4. Pr. *farinosa*, leaves crenate smooth mealy beneath, scape umbellate, flowers erect, limb of the cor. plane. *p.* 71.—*Subalpine pastures.*

4. CENTUNCULUS.

Cal. 4-lobed. *Cor.* tubular, 4-cleft. *Stam.* 4, short. *Caps.* globose, of 1 cell, many-seeded, opening all round transversely.

1. C. *minimus.* *p.* 54.—*Moist gravelly places.*

5. TRIENTALIS.

Calyx 7-partite. *Cor.* rotate in 7 segments, regular and flat. *Berry* dry, opening at the sutures.

1. Tr. *europæa. p.* 115.—*Woods.*

(*Allied to Primulaceæ.*)

6. SAMOLUS.

Cal. half-adherent, 5-fid. *Cor.* subhypocrateriform, 5-lobed. *Stam.* 5, antheriferous, opposite the segments of the cor., 5 (scales) alternate with them, sterile. *Caps.* half inferior, ovate, with 5 short valves, 1-celled. *Receptacle* central, free. *Seeds* numerous, fixed near each extremity. *Embryo* included, albuminose. *Radicle* turned towards the *hilum* of the seed.

Leaves alternate, entire. *Flowers* terminal, subracemose or corymbose, white; with the pedicels bracteated at the base or middle. *Br.*

Differ from *Primulaceæ*, in having the *ovary* with its base at least inferior, in the seeds umbilicated near each extremity, and in the 5 sterile *stamens. Br.*

1. S. *Valerandi,* leaves obtuse, racemes many-flowered, pedicels with a small bractea. *p.* 80.—*Marshes.*

7. GLAUX.

Cal. campanulate, 5-lobed, coloured. *Cor.* none. *Stam.* 5. *Caps.* globose, 5-valved, 5-seeded.

1. G. *maritima. p.* 82.—*Salt marshes.*

ORDER XV. LENTIBULARIÆ. *Rich.*

(*Utriculinæ Hoffm.* and *Link. Lysimachiæ,* part of, *Juss.*)

Calyx persistent, divided. *Cor.* monopetalous, irregular, spurred, bilabiate. *Stam.* 2, included, inserted at the base of the *Cor. Anthers* simple, sometimes contracted in the middle. *Ovary* 1-celled. *Style* 1, very short. *Stigma* 2-lipped. *Caps.* 1-celled, many-seeded, with a large central receptacle. *Seeds* small, without albumen. *Embryo* sometimes undivided. *Br.*

Aquatics or Marsh *Herbs* *Leaves* radical. *Flowers* usually with one bractea; rarely with none. *Br.*

1. UTRICULARIA.

Cal. 2-partite, lips undivided, nearly equal. *Cor.* personate, with the lower lip spurred at the base. *Stam.* 2, with the filaments internally, at the extremity, antheriferous. *Stigma* 2-lipped. *Br.*

1. U. *vulgaris,* spur conical, upper lip as long as the projecting palate, leaves pinnato-multifid. *p.* 8.—*Pools.*
2. U. *intermedia,* spur conical, upper lip twice as long as the palate, leaves tripartite their segments linear dichotomous. *p.* 9.—*Pools.*

3. U. *minor*, spur extremely short obtuse keeled, upper lip as long as the palate, leaves subtripartite the segments linear dichotomous. *p.* 9.—*Pools.*

2. PINGUICULA.

Cal. 4—5-cleft. *Cor.* ringent, spurred at the base beneath. *Stigma* two-lipped.

1. P. *vulgaris*, spur cylindrical acute as long as the veinless petal, upper lip two-lobed, lower one in three unequal obtuse segments. *p.* 8.—*Marshes.*
2. P. *Lusitanica*, spur obtuse curved shorter than the cor., divisions of the petals nearly equal, leaves and scape hairy. *p.* 8. —*Marshes on the W. coast.*

ORDER XVI. VERBENACEÆ. *Juss.*

(*Pyrenaceæ Vent.*, *Vitices*, *Juss.*)

Cal. tubular, persistent. *Cor.* hypogynous, monopetalous, deciduous, usually irregular. *Stam.* usually didynamous, rarely equal, sometimes 2. *Ovary* 2—4-celled. *Ovules* erect, solitary, or in pairs. *Style* 1. *Stigma* bifid or entire. *Fruit* a *Drupe* or *Berry*. *Embryo* straight with little or no *albumen*. *Radicle* inferior.

Trees or *Shrubs*; rarely *Herbs*. *Leaves* generally opposite, without *stipules*. *Br.*

1. VERBENA. *Juss.*

Cal. 5-fid. *Cor.* infundibuliform; *limb* unequal, 5-cleft. *Stam.* 4, didynamous. *Pericarp* thin, evanescent. *Seeds* 4. *Flowers* paniculato-spicate. *Br.*

1. V. *officinalis*, tetrandrous, spikes slender panicled, leaves much cut, stem erect solitary. *p.* 190.—*Waste places, rare.*

ORDER XVII. MELAMPYRACEÆ. *Rich. in Analyse du Fruit.*

(*Pediculares, part of, Juss.*)

Cal. divided, deciduous. *Cor.* personate, monopetalous, hypogynous. *Stam.* 4, didynamous. *Stigma* simple. *Caps.* naked, 2-celled, 2-seeded. *Seeds* erect, rostellate, with a minute embryo at the opposite end of the seed to the point of insertion. *Albumen* fleshy. *Radicle* superior.

Herbs with opposite leaves. *Flowers* in spikes, half covered with crested bracteæ.

1. MELAMPYRUM.

Cal. tubular, 4-fid. *Cor.* tubular, compressed; lips turned back at the margin; lower one trifid. *Stam.* 4, didynamous. *Caps.* oblong, 2-celled, oblique, opening on one side. *Cells* 1-seeded. *Seeds* gibbous at the base.

1. M. *pratense*, flowers axillary secund, leaves in distant pairs, cor. 4 times as long as the cal. closed, the lower lip protruded, upper bracteas pinnato-dentate. *p.* 187.—*Woods.*
2. M. *sylvaticum*, flowers axillary secund, leaves in distant pairs, cor. half as long again as the cal. open, the lower lip equal in length to the upper one, bracteas entire. *p.* 187.—*Alpine woods.*

ORDER XVIII. LABIATÆ. *Juss.*

Cal. tubular. *Cor.* monopetalous, hypogynous, irregular. *Stam.* mostly 4, didynamous, 2 sometimes sterile or wanting. *Style* 1. *Stigma* two-lobed. *Caryopsides* (*naked seeds Linn.*) four, inclosed in the *cal.* *Seed* solitary, erect. *Embryo* erect. *Albumen* none.

Leaves opposite. *Stem* square. *Br.*

DIV. I. *Stam. two, fertile.*

1. LYCOPUS.

Cal. tubular, 5-cleft, mouth naked. *Cor.* tubular, nearly equal, 4-lobed, upper segment broader and notched. *Stam.* distant, simple.

1. L. *europæus*, leaves deeply sinuato-serrate. *p.* 9.—*Ditch-banks.*

2. SALVIA.

Cal. subcampanulate, two-lipped; upper lip tridentate, the lower one bifid. *Cor.* ringent. *Filaments* two, fertile, bifid, one lobe ascending with a dimidiate *anther*, the other sterile. *Br.*

1. S. *verbenaca*, leaves serrated sinuated, cor. narrower than the cal. *p.* 10.—*Pastures, rare.*

DIV. II. *Stam. 4, didynamous, fertile.*

SECT. I. *Cal. 5- or 10-cleft, subregular.*

3. AJUGA.

Upper *lip* of the *Cor.* very minute, notched; lower one 3-lobed, middle lobe the largest, obcordate. *Stam.* exserted. *Anthers* reniform, 1-celled.

* *With creeping scions.*

1. A. *reptans*, glabrous, stem solitary throwing out creeping scions. *p.* 179.—*Woods, &c.*

** *Without creeping scions.*

2. A. *pyramidalis*, hairy, whorls crowded into a pyramidal and tetragonal form, radical leaves very large obovate more or less crenate. *p.* 179.—*Mountains.*

3. A. *alpina*, leaves nearly glabrous unequally toothed all nearly of a size, whorls of flowers rather distant. *p.* 180.—*Alps.*

4. TEUCRIUM.

Upper *lip* of the *Cor.* abbreviated, bipartite; lower one 3-lobed, its middle lobe the largest. *Stam.* projecting through the cleft in the upper lip.

1. T. *Scorodonia*, leaves cordate petiolate pubescent crenate, flowers in lateral and terminal racemes secund, stem erect. *p.* 180.—*Dry woods, &c.*
2. T. *Chamædrys*, leaves ovate tapering into a footstalk inciso-serrate, flowers axillary in threes, stem subprocumbent rounded hairy. *p.* 180.—*Walls.*

5. NEPETA.

Upper *lip* of the *Cor.* notched; the lower one 3-lobed; its middle lobe the largest, crenate; lateral ones very short, reflexed.

1. N. *cataria*, flowers in spiked subpedunculated whorls, leaves petiolate cordate dentato-serrate. *p.* 180.—*Waste places.*

6. MENTHA.

Cor. nearly regular, 4-lobed; its broadest lobe notched. *Stam.* erect, distant.

1. M. *hirsuta*, flowers capitate or whorled, leaves petiolate ovate serrated pubescent, cal. hairy, pedicels with reflexed hairs. *p.* 180.—*Marshes.*
2. M. *rubra*, flowers whorled, leaves petiolate ovate serrated subglabrous, "stem upright zig-zag" (*Sm.*), pedicels and lower part of the cal. quite glabrous, teeth hairy. *p.* 180.—*Sides of ditches.*
3. M. *gentilis*, flowers whorled, leaves petiolate ovate serrated subglabrous, "stem much branched spreading" (*Sm.*), pedicels and lower part of the cal. glabrous, teeth hairy. *p.* 181.—*Sides of rivers.*
4. M. *arvensis*, flowers whorled, leaves ovate hairy serrated, calyx campanulate and clothed with spreading hairs. *p.* 181.—*Cornfields.*
5. M. *Pulegium*, flowers whorled, leaves downy ovate obtuse subcrenate, stem prostrate, flowerstalks slightly, and calyx very, pubescent, teeth of the latter fringed. *p.* 181.—*Among rubbish.*

7. GLECHOMA.

Upper *lip* of the *Cor.* bifid; lower one trifid, with the intermediate lobe emarginate. *Anthers* approaching each other in pairs and forming a cross.

1. G. *hederacea*, leaves reniform crenate. *p.* 181.—*Hedges.*

8. LAMIUM.

1. L. *album*, leaves cordato-acuminate deeply serrated petiolate, whorls of about 20 flowers. *p*. 181.—*Borders of fields*.
2. L. *maculatum*, leaves cordato-acuminate inciso-serrate petiolate, whorls of about 10 flowers. *p*. 181.—*Woods*.
3. L. *purpureum*, leaves cordate obtuse crenato-serrate petiolate, the uppermost crowded together, "cor. with the tube bearded within." (*Sm.*)—*Hedges*.
4. L. *incisum*, leaves broadly cordate obtuse inciso-crenate petiolate, the uppermost crowded, "cor. with the tube glabrous within." (*Sm.*)—*Hedges*.
5. L. *amplexicaule*, leaves broadly cordate very obtuse deeply inciso-crenate petiolate, the floral ones sessile embracing the stem. *p*. 182.—*Sandy fields, &c.*

9. GALEOPSIS.

Cal. teeth acuminate. Upper *lip* of the *Cor.* vaulted, notched; lower *lip* with 3 unequal lobes, having 2 teeth on its upper side.

1. G. *Ladanum*, stem not swollen below the joints, leaves lanceolate subserrate hairy, upper lip of the cor. slightly crenate. *p*. 182.—*Limestone rubbish*.
2. G. *Tetrahit*, stem hispid incrassated below the joints, leaves ovate hispid serrated, cor. twice as long as the cal., upper lip nearly straight. *p*. 182.—*Corn-fields*.
3. G. *versicolor*, stem hispid incrassated below the joints, leaves ovate hispid serrated, cor. thrice as long as the cal., upper lip inflated. *p*. 182.—*Corn-fields*.

10. GALEOBDOLON.

Cal. teeth unequal, acuminate. Upper *lip* of the *Cor.* vaulted, entire; lower one in 3 acute segments.

1. G. *luteum*. *p*. 183.—*Woods*.

11. BETONICA.

Cal. teeth acuminate. Upper *lip* of the *Cor.* ascending; lower 3-cleft, its tube cylindrical.

1. B. *officinalis*, spike interrupted, middle segment of the lower lip notched. *p*. 183.—*Woods*.

12. STACHYS.

Cal. acuminate. Upper *lip* of the *Cor.* vaulted; lower one 3-lobed, with the 2 lateral lobes reflexed. *Stam.*, when old, bent downwards.

1. S. *sylvatica*, whorls of 6 flowers, leaves cordato-ovate acute petiolate, "stem solid." (*Sm.*) *p*. 183.—*Woods*.

2. S. *ambigua,* whorls of 6 flowers, leaves oblongo-cordate acute petiolate, stem hollow. (*Sm.*) *p.* 183.—*Fields.*
3. S. *palustris,* whorls of 6 flowers, leaves linear-lanceolate semi-amplexicaul. *p.* 183.—*Marshes.*
4. S. *arvensis,* whorls of 6 flowers, stem weak, leaves heart-shaped obtuse crenate slightly hairy, cor. scarcely longer than the cal. *p.* 183.—*Corn-fields.*

13. BALLOTA.

Cal. with 10 ribs and 5 teeth. Upper *lip* of the *Cor.* concave, notched; lower one trifid; middle lobe the largest, emarginate.

1. B. *nigra,* leaves ovate undivided serrated, calyces dilated upwards subtruncated, the teeth patent. (*Sm.*) *p.* 184.—*Waste places.*

14. MARRUBIUM.

Cal. with 10 ribs and 5 or 10 spreading teeth. Upper *lip* of the *Cor.* cloven, linear, straight; lower one trifid; middle segment the largest, emarginate.

1. M. *vulgare,* stem erect, leaves roundish ovate toothed wrinkled, cal. with 10 setaceous hooked teeth. *p.* 184.—*Waste places.*

15. LEONURUS.

Cal. with 5 angles. Upper *lip* very hairy above, entire; lower one reflexed, 3-partite. *Anthers* sprinkled with shining dots.

1. L. *Cardiaca,* leaves petiolate, the lower ones crenato-lanceolate 3-lobed, upper ones entire. *p.* 184.—*Among rubbish.*

SECT. II. *Calyx 2-lipped.*

16. CLINOPODIUM.

Involucre (bracteas of many linear-acuminate leaflets placed under the *cal.* Upper *lip* of the *cor.* erect, emarginate; lower one the largest, emarginate.

1. Cl. *vulgare,* leaves ovate obscurely serrated, whorls hairy, bracteas setaceous, pedicels branched. *p.* 184.—*Banks.*

17. ORIGANUM.

Calyces collected, by imbricated bracteas, into a spicate, quadrangular cone. Upper *lip* of the *cor.* straight, notched; the lower one in 3 nearly equal lobes.

1. O. *vulgare,* spikes roundish panicled conglomerate glabrous, bracteas ovate longer than the cal., leaves ovate entire. *p.* 185. —*Bushy places.*

18. THYMUS.

Cal. closed with hairs at the mouth. *Cor.* shortly 2-lipped: upper one notched; the lower one the largest, subemarginate.

1. Th. *Serpyllum*, flowers capitate, stems branched decumbent, leaves plane ovate obtuse entire petiolate more or less ciliated at the base. *p.* 185.—*Hills.*
2. Th. *Acinos*, flowers on simple stalks about 6 in a whorl, stem ascending branched, leaves oblong shortly petiolate acute serrated, cal. gibbous at the base. *p.* 185.—*Dryhills.*

19. SCUTELLARIA.

Lips of the *cal.* closing over the fruit; upper *lip* with a vaulted process.

1. S. *galericulata*, leaves cordato-lanceolate crenate, flowers axillary in pairs. *p.* 185.—*Marshes.*
2. S. *minor*, leaves cordato-ovate entire, flowers axillary in pairs. *p.* 185.—*Marshes.*

20. PRUNELLA.

Upper *lip* of the *cal.* with 3 very short teeth. *Filaments* forked at the extremity, one point bearing the *Anther. Stigma bifid.*

1. Pr. *vulgaris*, leaves petiolate oblongo-ovate somewhat toothed at the base. *p.* 185.—*Pastures.*

ORDER XIX. SCROPHULARINÆ. *Br.*

(*Scrophulariæ and Pediculares Juss. Rhinanthaceæ Decand. Fl. Fr. Antirrhineæ Decand. th.*)

Cal. persistent. *Cor.* monopetalous, hypogynous, generally irregular, deciduous, with an imbricated æstivation. *Stam.* generally 4, didynamous, rarely equal, sometimes 2. *Style* 1. *Stigma* 2-lobed, rarely undivided. *Caps.* (very rarely a *Berry*) 2-celled, 2—4-valved; the valves entire or bifid, with a dissepiment either double from the inflexed margin of the valves, or simple, parallel and entire, or opposite and bipartible. *Receptacle* of the *seeds* central, united to the dissepiment, or eventually separate. *Seeds* numerous. *Embryo* straight, inclosed in the axis of a fleshy *albumen.*

Herbs (sometimes *shrubs*) usually with opposite *leaves.* Inflorescence various. *Br.*

DIV. I. *Stam.* 4, *didynamous.*

SECT. I. *Calyx* 4-*fid.*

* *Calyx* 4-*cleft.*

1. EUPHRASIA.

Cal. tubular, 4-toothed. Upper *lip* of the *cor.* divided; lower one of 3 notched lobes. *Anthers* with their lobes mucronated at the base. *Caps.* ovato-oblong, 2-celled. *Seeds* striated.

1. E. *officinalis*, leaves ovate deeply toothed, veins furrowed. *p.* 186.—*Pastures.*

2. BARTSIA.

Cal. mostly coloured. *Cor.* ringent, with a contracted orifice; upper *lip* concave, longest, entire; lower one in 3, equal, reflexed lobes. *Caps.* ovate, compressed, with 2 cells and many angular *seeds.*

1. B. *alpina*, leaves opposite cordato-ovate obtusely serrated, flower subspicate, anthers hairy. *p.* 186.—*Mountain pastures, rare.*
2. B. *viscosa*, leaves lanceolate serrated, the upper ones alternate, flowers lateral and distant, anthers hairy. *p.* 186.—*Marshes.*
3. B. *Odontites*, leaves lanceolate, upper ones alternate, flowers racemed secund, anthers subglabrous, stem branched. *p.* 186. —*Corn-fields.*

3. RHINANTHUS.

Cal. inflated, 4-toothed. Upper *lip* of the *cor.* compressed; lower one plane, 3-lobed. *Caps.* of 2 cells, obtuse, compressed, and with many imbricate plane *seeds.*

1. Rh. *Crista Galli*, upper lip of the cor. arched, calyx glabrous, leaves lanceolate serrated. *p.* 187.—*Marshes.*

** *Calyx 5-cleft.*

4. PEDICULARIS.

Cal. inflated, (mostly) 5-cleft. Upper *lip* of the *cor.* compressed, arched; lower one plane, 3-lobed. *Caps.* oblique, compressed, 2-celled. *Seeds* angular.

1. P. *palustris*, stem solitary branched, cal. ovate hairy ribbed 2-lobed and crenate. *p.* 187.—*Marshes.*
2. P. *sylvatica*, stems many from the same root spreading, cal. oblong angular glabrous in 5 unequally notched segments. *p.* 188.—*Marshes.*

5. ANTIRRHINUM.

Cal. 5-partite. *Cor.* personate, with a deflexed prominence or spur at the base. *Caps.* 2-celled, opening at the extremity with minute valves.

* *Cor. spurred. Leaves broad. Stem lax.*

1. A. *Cymbalaria*, leaves cordate 5-lobed alternate glabrous, stems procumbent. *p.* 189.—*Walls.*

** *Cor. spurred. Leaves narrow. Stem erect.*

2. A. *repens*, leaves linear whorled or scattered, stem panicled, cal. glabrous the length of the spur, cor. striated. *p.* 188.—*Banks.*

3. A. *Linaria*, leaves linear-lanceolate scattered crowded, spikes terminal, flowers imbricated, cal. glabrous shorter than the spur. *p.* 188.—*Borders of fields, &c.*
4. A. *minus*, leaves linear-lanceolate obtuse mostly alternate pubescent, stem much branched spreading, cal. longer than the spur. *p.* 188.—*Sandy fields.*

*** *Cor. merely gibbous at the base.*

5. A. *majus*, leaves lanceolate alternate those of the branches opposite, flowers spiked, segments of the cal. ovate obtuse. *p.* 129.—*Walls.*

6. SCROPHULARIA.

Cor. subglobose; *limb* contracted, shortly 2-lipped; upper *lip* 2-lobed (with a scale or abortive stam. frequently within), lower 3-lobed. *Caps.* 2-celled.

1. S. *nodosa*, leaves cordate acute serrated glabrous, stem with 4 rather obtuse angles. *p.* 189.—*Moist woods.*
2. S. *aquatica*, leaves elliptical cordate at the base obtuse serrated glabrous decurrent, stem winged at the angles. *p.* 189.—*Sides of rivers.*
3. S. *vernalis*, leaves broadly cordate doubly serrated pubescent acute, peduncles axillary solitary dichotomous leafy. *p.* 189.—*Waste places, rare.*

7. DIGITALIS.

Cal. 5-partite. *Cor.* campanulate, inflated beneath; *limb* obliquely 5-lobed, unequal. *Caps.* ovate, of 2 cells and many *seeds.*

1. D. *purpurea*, segments of the cal. ovate acute, cor. obtuse, its upper lip undivided, leaves ovate crenate downy. *p.* 189.—*Hilly pastures.*

8. LIMOSELLA.

Cor. shortly campanulate, 5-cleft, equal. *Caps.* semibilocular, 2-valved.

1. L. *aquatica*. *p.* 190.—*Muddy places.*

DIV. II. *Stamina* 2. *Caps.* 2-*celled. Br.*

9. VERONICA.

Cal. 4-, rarely 5-partite. *Cor.* subrotate. *Tube* shorter than the *calyx;* its *limb* 4-partite, unequal, with undivided lobes. *Stam.* 2, antheriferous, sterile ones none. *Caps.* with the valves bearing the dissepiments in the middle, or bipartible.

Herbs or *Shrubs*. *Leaves* opposite, sometimes whorled or alternate, frequently dentate or cut. *Inflorescence* various. *Calyces* without bracteæ. *Br.*

* *Spikes or racemes terminal (plants perennial).*

1. V. ***serpyllifolia***, racemes spiked many-flowered, leaves ovate slightly crenate, caps. broadly obcordate as long as the style. *p.* 4.—*Pastures.*

β. ***alpina***, stems prostrate, racemes shortly spiked.—*Alps.*

2. V. ***alpina***, raceme corymbose, leaves elliptico-ovate subserrate, capsule ovato-cordate longer than the style. *p.* 4.—*Alps.*

3. V. ***saxatilis***, raceme lax few-flowered corymbose, upper leaves oblongo-obovate subserrate, stems spreading, capsule ovate longer than the calyx. *p.* 5.—*Alps.*

4. V. ***fruticulosa***, raceme many-flowered subspicate, upper leaves oblong serrate, stems procumbent, capsule ovate scarcely longer than the calyx. *p.* 5.—*Alps.*

** *Spikes or racemes axillary (plants perennial).*

5. V. ***scutellata***, racemes alternate, pedicels divaricated, leaves linear somewhat toothed, stem nearly erect. *p.* 6.—*Bogs.*

6. V. ***Anagallis***, racemes opposite, leaves lanceolate serrate, stem erect. *p.* 6.—*Ditches.*

7. V. ***Beccabunga***, racemes opposite, leaves elliptical obtuse subserrate glabrous, stem procumbent throwing out roots at the base. *p.* 6.—*Ditches.*

8. V. ***officinalis***, flowers spiked, leaves broadly ovate serrate rough with short thick pubescence, stem procumbent very pubescent, capsule obcordate deeply notched. *p.* 6.—*Woods, &c.*

9. V. ***hirsuta***, flowers spiked, leaves ovato-lanceolate acute slightly serrated with a few scattered hairs, stem procumbent glabrous near the base, capsule obcordate entire. *p.* 6.—*Dry heathy places, rare.*

10. V. ***montana***, racemes few-flowered, leaves cordato-ovate petiolate serrate, stem hairy on all sides. *p.* 6.—*Woods.*

11. V. ***Chamædrys***, flowers racemed, leaves ovate obtuse sessile inciso-serrate, stem bifariously hirsute. *p.* 7.—*Woods.*

12. V. ***Allionii***, flowers densely spiked, leaves ovate subserrated rigid and, as well as the procumbent stem, perfectly glabrous. *p.* 7.—*Mountains of Angus.*

*** *Flower axillary, solitary (plants annual).*

13. V. ***agrestis***, leaves (all) petiolate cordato-ovate inciso-serrate shorter than the flowerstalks, stem procumbent. *p.* 7.—*Fields.*

14. V. ***arvensis***, leaves cordato-ovate serrate, the lower ones petiolate, floral leaves sessile lanceolate longer than the flowerstalk, stem nearly erect. *p.* 7.—*Walls, &c.*

15. V. ***hederifolia***, leaves cordato-ovate mostly 5-lobed, calycine segments cordate ciliated, stem procumbent. *p.* 7.—*Fields and banks.*

ORDER XX. OROBANCHEÆ. *Rich. in Pers.*

(*Allied to Pediculares, Juss.*)

Cal. and *Cor.* 5-cleft, persistent; the latter irregularly monopetalous, hypogynous. *Stam.* didynamous. *Stigma* 2-lobed. *Caps.* 1—2- or many-celled, 2-valved. *Seeds* small, with a minute round embryo at the base of a fleshy *albumen.*

Parasitical, leafless *Herbs.*

1. OROBANCHE.

Cal. of 2 (generally) lobed, lateral segments. *Cor.* ringent. *Caps.* 1-celled, 2-valved, with many seeds. A *gland* at the base of the germen beneath.

1. O. *major*, stem simple, cor. tubular, its upper lip undivided, lower one in 3 nearly equal segments, their lateral ones acute, the terminal one largest obtuse, stam. glabrous, style downy. *p.* 190.—*Roots of plants.*
2. O. *rubra*, stem simple, cor. tubular, its upper lip 2-lobed, lower one in 3 equal obtuse lobes, stam. partially glanduloso-pilose, style glabrous. *p.* 191.—*Basaltic rocks.*

2. LATHRÆA.

Cal. 4-cleft. *Cor.* tubular, 2-lipped. A depressed *gland* at the base of the suture of the germen. *Caps.* 1-celled.

1. L. *squamaria*, stem simple, flowers pendulous, their lower lip 3-cleft. *p.* 187.—*Woods.*

ORDER XXI. SOLANEÆ. *Juss.*

Cal. 5- (rarely 4-) partite, divided, persistent. *Cor.* monopetalous, hypogynous; its limb 5-cleft, equal, or somewhat unequal, deciduous; with a plicate æstivation. *Stam.* inserted into the *cor.*, alternate with its segments, and equal to them in number, sometimes 1 abortive. *Ovary* 1—2—4-celled, many-seeded. *Style* 1. *Stigma* obtuse, rarely lobed. *Pericarp* 2—4-celled; either a capsule with a parallel double dissepiment, or a *berry* with the *receptacles* united to the dissepiments. *Seeds* numerous. *Embryo* included in a fleshy *albumen*, more or less bent; often out of the axis. *Radicle* opposite the hilum.

Herbs or *Shrubs*. *Leaves* alternate, without *stipules*, sometimes opposite, beneath the flowers. *Br.*

DIV. I. *Fruit capsular.*

1. VERBASCUM.

Cal. 5-partite. *Cor.* rotate, 5-lobed, unequal. *Stam.* 5, declined, often hairy. *Caps.* 2-valved, ovate or globose.

1. V. *Thapsus*, leaves decurrent woolly on both sides, stem simple, 2 stam. longer glabrous. *p.* 78.—*Waste places.*
2. V. *Lychnitis*, leaves oblong wedge-shaped nearly glabrous on the upper side, stem angled paniculate. *p.* 78.—*Road-sides.*
3. V. *pulverulentum*, leaves ovato-oblong subserrate pulverulento-tomentose on both sides, stems rounded panicled. *p.* 78. —*Waste places.*
4. V. *nigrum*, leaves oblongo-cordate petiolate crenate subpubescent. *p.* 78.—*Banks and hedges.*

2. HYOSCYAMUS.

Cal. tubular, 5-cleft. *Cor.* infundibuliform, irregular, its lobes obtuse. *Stam.* 5. *Stigma* capitate. *Capsule* ovate, operculated at the extremity.

1. H. *niger*, leaves amplexicaul sinuated, flowers nearly sessile. *p.* 78.—*Waste places.*

Div. II. *Fruit berried.*

3. ATROPA.

Cal. 5-cleft. *Cor.* campanulate, 5-lobed, equal. *Stam.* 5, distant. *Berry* globose, 2-celled.

1. A. *Belladonna*, stem herbaceous, leaves ovate undivided. *p.* 78.—*Waste places.*

4. SOLANUM.

Cal. 5-cleft. *Cor.* rotate, 5-fid, patent. *Anthers* 5, erect, connivent, opening with 2 pores at the extremity. *Berry* subglobose, 2- rarely 4-celled. *Embryo* curved.

1. S. *Dulcamara*, stem without thorns shrubby climbing, leaves cordate glabrous superior ones hastate, corymbs opposite the leaves drooping. *p.* 79.—*Hedges.*
2. S. *nigrum*, stem without thorns herbaceous, leaves ovate bluntly toothed and waved, umbels lateral drooping. *p.* 79.—*Waste places.*

ORDER XXII. BORAGINEÆ. *Juss.*

Cal. 5- (rarely 4-) partite, persistent. *Cor.* hypogynous, monopetalous, most frequently regular, 5-cleft, sometimes 4-cleft, with imbricated æstivation. *Stam.* inserted into the *cor.*, alternate with its segments, and equal to them in number, rarely more. *Ovary* 4-partite, 4-seeded, or simple, 2—4-celled. *Ovules* definite, pendulous. *Achenia* 4, distant, or united at the base; or a 4-celled *drupe*; or a *berry* with 2—4 stones. *Seeds* without, or nearly without, *albumen*. *Radicle* superior.

Herbs or *Shrubs*. *Leaves* alternate, without stipules, usually scabrous. *Flowers* usually in one-sided, more or less compound spikes or racemes. *Br.*

1. MYOSOTIS.

Cal. 5-cleft. *Cor.* hypocrateriform, the segments very obtuse, its orifice closed with short connivent scales.

(*Seeds naked.*)

1. M. *sylvatica*, leaves oblongo-lanceolate with soft hairs, racemes very long lax, pedicels (in fruit) divergent patent longer than the 5-fid connivent cal., limb of the cor. expanded longer than the tube. *p* 66.—*Woods.*
2. M. *alpestris*, leaves oblongo-lanceolate hairy, racemes short, pedicels (in fruit) patent rather longer than the connivent 5-fid cal., limb of the cor. expanded longer than the tube. *p.* 66. —*Alps.*
3. M. *palustris*, leaves oblongo-lanceolate rough with short mostly depressed hairs, racemes rather short, peduncles (in fruit) divergent twice as long as the 5-toothed patent cal., limb of the cor. expanded longer than the tube. *p.* 67.—*Ditch banks.*
4. M. *arvensis*, leaves oblongo-lanceolate hairy, racemes very long, pedicels (in fruit) patent twice the length of the 5-cleft and closed cal., limb of the cor. erecto-patent about as long as the tube. *p.* 67.—*Waste places.*
5. M. *versicolor*, leaves oblongo-lanceolate hairy, racemes very long, pedicels (in fruit) erecto-patent shorter than the 5-cleft acute closed cal., limb of the cor. patent shorter than the tube. *p.* 67.—*Dry waste places.*

2. LITHOSPERMUM.

Cal. 5-partite. *Cor.* infundibuliform, its orifice naked.

1. L. *officinale*, stem erect very much branched, leaves broadly lanceolate acute nerved rough above hairy beneath, tube of the cor. as long as the cal., nuts smooth. *p.* 68.—*Waste places.*
2. L. *arvense*, stem erect branched, leaves lanceolate acute hairy, cal. a little shorter than the cor., its segments patent when containing the ripe rugose nuts. *p.* 68.—*Corn-fields.*
3. L. *maritimum*, glabrous, stem procumbent branched, leaves ovate obtuse fleshy glaucous. *p.* 68.—*Sea-shores.*

3. ANCHUSA.

Cal. 5-cleft, or 5-partite. *Cor.* infundibuliform, its orifice closed with convex connivent scales. *Seeds* (or *Nuts*) hollowed out at the base.

1. A. *sempervirens*, leaves ovate nearly entire lower ones upon

long footstalks, peduncles axillary, flowers subcapitate accompanied by two leaves. *p.* 68.—*Banks.*

4. CYNOGLOSSUM.

Cal. 5-cleft. *Cor.* (short), infundibuliform, its orifice closed with convex connivent scales. *Seeds* (or *Nuts*) depressed, fixed to the style by their inner margin.

1. C. *officinale*, stem leaves lanceolate attenuate at the base sessile downy, stamen shorter than the cor. *p.* 69.—*Waste places.*
2. C. *sylvaticum*, stem leaves lanceolate broad at the base shining sessile slightly hairy and scabrous especially beneath, stamens shorter than the cor. *p.* 69.—*Waste places.*

5. PULMONARIA.

Cal. prismatic, 5-cleft. *Cor.* infundibuliform, its orifice naked.

1. P. *officinalis*, leaves scabrous, radical ones ovato-cordate petiolate, superior ones of the stem sessile ovate. *p.* 69.—*Woods.*

6. SYMPHYTUM.

Cal. 5-cleft. *Cor.* ventricose, its orifice closed with connivent subulate scales.

1. S. *officinale*, stem winged above, leaves ovato-lanceolate attenuate at the base and very decurrent. *p.* 69.
2. S. *tuberosum*, stem simple, leaves ovato-oblong attenuate at the base, upper ones only very slightly decurrent. *p.* 69.—*Meadows.*

7. BORAGO.

Cal. 5-cleft. *Cor.* rotate, having at its orifice 5 obtuse emarginate teeth.

1. B. *officinalis*, lower leaves obovate attenuate at the base, segments of the cor. ovate acute spreading. *p.* 70.—*Road-sides.*

8. ASPERUGO.

Cal. 5-cleft, unequal, with alternate smaller teeth. *Cor.* (short), infundibuliform, its orifice closed with convex connivent scales. *Seeds* (or *Nuts*) covered with the conduplicate and compressed *cal.*

1. A. *procumbens.* *p.* 70.—*Waste places.*

9. LYCOPSIS.

Cal. 5-cleft. *Cor.* infundibuliform, with an incurved tube, its orifice closed with convex connivent scales.

1. L. *arvensis*, leaves lanceolate repando-denticulate very hispid, cal. erect while in flower. *p.* 70.—*Corn-fields and banks.*

10. ECHIUM.

Cor. irregular, its orifice open and naked. *Stigma* bipartite.

1. E. *vulgare*, stem herbaceous simple hispid with tubercles,

leaves linear-lanceolate hispid, flowers in lateral spikes, stamens longer than the cor. *p.* 70.—*Corn-fields and waste places.*

ORDER XXIII. CONVOLVULACEÆ. *Juss.*

Cal. 5-partite, persistent. *Cor.* monopetalous, hypogynous, deciduous, with a regular 5-lobed, often plaited limb. *Stam.* 5, inserted into the base of the *cor.*, and alternate with its segments. *Ovary* simple, 2—4-celled, rarely nearly 1-celled; sometimes 2—4-parted, surrounded with an hypogynous disk. *Ovules* definite, erect. *Style* usually divided at the top, sometimes almost to the base. *Stigmas* obtuse or acute. *Caps.* 1—4-celled; *valves* with their margins opposite the angles of the free dissepiment, which bears its seeds at its base; sometimes not opening, or splitting transversely. *Embryo* curved and surrounded with mucilaginous albumen. *Cotyledons* wrinkled. *Radicle* inferior.

Herbs or *Shrubs* usually climbing and lactescent. *Leaves* alternate with stipules. *Flowers* axillary or terminal. *Br.*

1. CONVOLVULUS. *Jacq. Br.*

Cal. 5-partite, naked or imbricated with 2 smaller bracteas. *Cor.* campanulate, with 5 plaits. *Stam.* shorter than the limb. *Ovary* 2-celled (rarely 3 ?); cells 2-seeded. *Style* undivided. *Stigmas* 2, filiform. *Caps.* valved. *Br.*

1. C. *arvensis*, stem climbing, leaves sagittate, their lobes acute, peduncles mostly 1-flowered, bracteas minute remote from the flower. *p.* 73.—*Fields.*

2. C. *Sepium*, stem climbing, leaves sagittate, the lobes truncate, peduncles 4-sided single-flowered, bracteas large heart-shaped close to the flower. *p.* 74.—*Hedges.*

3. C. *Soldanella*, stem prostrate, leaves reniform fleshy, peduncles 1-flowered 4-sided, their angles winged. *p.* 74.—*Sandy sea-shores.*

2. CUSCUTA.

Cal. 5-, rarely 4-cleft. *Cor.* globoso-urceolate; limb 4—5-cleft, marcescent. *Ovary* 2 cells; *cells* 2-seeded. *Capsule* 2-celled, opening all round transversely. *Embryo* spiral.

Leafless *Herbs* climbing, parasitic.

1. C. *europæa*, flowers sessile, cor. 4—5-cleft without any scale at the base of the stam., stigmas simple. *p.* 86.—*On nettles, &c., parasitic.*

2. C. *Epithymum*, flowers sessile, cor. mostly 4-cleft, with a small fringed scale at the base of each stam., stigmas simple. *p.* 86.—*On furze, &c., parasitic.*

ORDER XXIV. POLEMONIACEÆ. *Juss.*

Cal. 5-partite, persistent. *Cor.* monopetalous, hypogynous, regular, 5-lobed. *Stam.* 5, inserted into the middle of the tube of the *cor.*, and alternate with its segments. *Style* 1. *Stigma* simple. *Caps.* 3-celled, 3-valved, many-seeded; *valves* having in their middle the dissepiments, which are opposite to the angles of the distinct receptacles. *Seeds* numerous. *Embryo* in the axis of a fleshy albumen.

Herbs or *Shrubs.* *Leaves* alternate or opposite. *Flowers* terminal or axillary. *Juss.*

1. POLEMONIUM.

Cal. urceolate, 5-cleft. *Cor.* rotate, the tube short, the limb 5-lobed. *Stam.* 5; filaments broader at the base, inserted upon the 5 teeth or valves, which close the orifice of the *cor.* *Anth.* incumbent.

1. P. *cæruleum*, leaves pinnated, flowers erect, cal. longer than the tube of the cor. *p.* 74.—*Woods and banks, rare.*

ORDER XXV. GENTIANEÆ. *Juss.*

Cal. 1-leaved, divided, persistent. *Cor.* 1-petalous, hypogynous, generally regular, withering or deciduous; limb equal, with the same number of divisions as the cal., generally 5, sometimes 4—8, with an imbricated æstivation. *Stam.* inserted into the cor., alternate with its segments to which they are equal in number; some rarely abortive. *Ovary* single, 1—2-celled, many-seeded. *Style* 1 or 2. *Stigma* 1 or 2. *Capsule* (sometimes *Berry*) many-seeded, 1—2-celled, generally 2-valved; *valves* with their margins bent inwards, in the unilocular genera bearing the seeds; in the bilocular genera inserted into the central receptacle. *Seeds* small. *Embryo* straight, in the axis of a soft fleshy albumen. *Radicle* opposite the hilum.

Herbs, rarely *Shrubs.* *Leaves* opposite, without stipules. *Flowers* terminal or axillary. *Br.*

1. GENTIANA.

Cal. 4—5-cleft. *Cor.* infundibuliform and hypocrateriform, 4—5-cleft, with the orifice naked. *Stigma* 2-lobed. *Caps.* 1-celled. *Seeds* without any margin.

* *Mouth of the cor. naked, not ciliated.*

1. G. *nivalis*, cor. 5-cleft infundibuliform, branches alternate 1-flowered, cauline leaves lanceolate. *p.* 86.—*Alps.*

*** Mouth of the cor. ciliated.*

2. G. *amarella*, cor. 5-cleft hypocrateriform bearded in the orifice, cal. 5-cleft, segments equal. *p.* 86.—*Pastures.*
3. G. *campestris*, cor. 4-cleft hypocrateriform bearded in the orifice, cal. of 4 leaflets two outer ones very large. *p.* 86.—*Pastures.*

2. ERYTHRÆA.

Cal. 5-cleft. *Cor.* infundibuliform, with the limb short, marcescent. *Anthers* after flowering spiral. *Style* erect. *Stigmas* 2, roundish. *Capsule* 1-celled, linear.

1. E. *Centaurium*, stem nearly simple, leaves ovato-oblong, flowers sessile (or nearly so) fasciculato-paniculate, cal. half as long as the tube of the cor. *p.* 79.—*Dry pastures.*
2. E. *pulchella*, stem very much branched, leaves ovato-oblong, flowers pedicellate in lax panicles, cal. as long as the tube of the cor. *p.* 79.—*Sea-shores.*
3. E. *littoralis*, stem simple or much branched, leaves ovato-oblong, flowers sessile capitato-paniculate, cal. as long as the tube deeply cleft. *p.* 80.—*Sea-shores.*

3. MENYANTHES.

Cal. 5-partite. *Cor.* infundibuliform; its limb patent, 5-lobed, equal, hairy within. *Stam.* 5. *Style* 1. *Stigma* capitate. *Caps.* 1-celled, with the axis of the valves seminiferous.

1. M. *trifoliata*. *p.* 71.—*Marshes.*

ORDER XXVI. APOCINEÆ. *Br.*

Cal. 5-partite, persistent. *Cor.* 1-petalous, hypogynous, regular, 5-lobed, deciduous, with an imbricated æstivation. *Stam.* inserted into the *cor.*, and alternate with its segments. *Filaments* distant. *Anth.* 2-celled, bursting longitudinally. *Pollen* granular, applied immediately to the stigma. *Ovaries* 2—1, 2-celled, in most many-seeded. *Styles* 2 or 1. *Stigma* 1. *Fruit* a *Follicle*, *Capsule*, *Drupe*, or *Berry*, double or single. *Embryo* leafy, usually with albumen. *Plumule* inconspicuous.

Trees or *Shrubs* often milky. *Leaves* opposite, rarely scattered, often having fringes or glands between their stalks. *Br.*

1. VINCA.

(Seeds naked, not comate.)

Cal. 5-cleft. *Cor.* hypocrateriform; the tube long; the orifice prominent, pentagonal; the limb plane, obtusely 5-lobed. *Anthers* approximate. *Style* 1. *Stigma* capitate, annulated at the base.

1. V. *minor*, stems procumbent, leaves oblongo-lanceolate, their margins as well as the small lanceolate teeth of the cal. glabrous. *p.* 82.—*Woods.*
2. V. *major*, stems suberect, leaves ovato-subcordate, their margins as well as those of the elongated subulate segments of the cal. ciliated. *p.* 83.—*Woods.*

ORDER XXVII. OLEINEÆ. *Hoffm. and Link.*

(*Jasmineæ, part of, Juss.*)

Flowers perfect, or polygamous. *Cal.* 1-leaved, divided, persistent. *Cor.* hypogynous, monopetalous, 4-cleft, rarely of 4 petals, the petals being connected in pairs by the filaments, with a somewhat valvular æstivation; rarely none. *Stam.* 2, alternate, with the segments. *Anthers* 2-locular; the cells longitudinally bursting. *Ovary* simple, without disk, 2-celled. *Cells* 2-seeded. *Ovules* pendulous, collateral. *Style* 1 or none. *Stigma* 2-fid or undivided. *Drupe* or *Berry*, or *Capsule*, by abortion, often 1-seeded. *Embryo* in the midst of a fleshy albumen. *Cotyledons* leafy. *Radicle* superior.

Trees or *Shrubs*. *Leaves* opposite. *Flowers* in racemes or panicles, terminal or axillary; their *stalks* opposite, each with one bractea. *Br.*

1. FRAXINUS.

Cal 0, 3—4-cleft. *Cor.* 0, or of 4 *petals*. *Stam.* 2. *Caps.* 2-celled, 2-seeded, compressed and foliaceous at the extremity. *Seed* solitary, pendulous (*Flowers polygamous*).

1. F. *excelsior*, leaflets lanceolate acuminate serrated, flowers destitute of perianth. *p.* 3.—*Woods and hedges.*

2. LIGUSTRUM.

Cal. minute, 4-toothed. *Cor.* with the tube short; the limb 4-fid, patent. *Stam.* 2. *Berry* 1-celled, 2—4-seeded.

1. L. *vulgare*, leaves elliptico-lanceolate somewhat acute, panicle compact. *p.* 3.—*Hedges.*

ORDER XXVIII. ERICEÆ. *Juss.*

(*Rhododendra, Juss. Rhodoraceæ, Decand. Mirb.*)

Cal. inferior, persistent, 4—5-cleft. *Cor.* monopetalous, perigynous, 4—5-cleft, sometimes of 5 petals, usually withering, with an imbricated *æstivation*. *Stamens* definite, twice as many, or, rarely, equal in number to the *segments* of the *flower*, hypogynous, or inserted into the *petals*. *Anthers* 2-celled, frequently furnished with an *appendage* at their *base*, and emitting their *pollen* through a *pore* or *cleft*. *Ovary* surrounded by a *disk*, or secreting *glands*, many-celled; *ovules* numerous. *Style* 1. *Stigma* simple or toothed. *Capsule* many-celled, many-seeded, sometimes a *berry*; *dissepiments* attached to the edge or middle of the *valves*, or distinct from them. *Seeds* minute, attached by one extremity to central *receptacles*. *Embryo* cylindrical in the axis of a fleshy *albumen*.

Shrubs. *Leaves* entire, without *stipules*, alternate or whorled, or opposite. *Pedicels* with 2 or many *bracteas*. *Br. Mirb.*

1. ERICA.

Cal. 4-partite. *Cor.* of 1 *petal*; *limb* 4-fid. *Stam.* 8. *Anthers* before flowering connected by two lateral *pores*. *Caps.* 4-celled, 4-valved; *dissepiments* from the middle of the *valves*.

1. E. *cinerea*, anthers with two serrated appendages at the base, style a little exserted, stigma capitate, leaves ternate. *p.* 119. —*Heaths.*
2. E. *Tetralix*, anthers with two awns at the base, style as long as the ovate cor., leaves in fours ciliated, flowers capitate. *p.* 119.—*Moorish grounds.*

2. CALLUNA.

Cal. double, 4-partite, inner one coloured. *Caps.* with the *dissepiments* opposite the *margins* of the *valves*, and separating from them.—The rest as in *Erica*.

1. C. *vulgaris*. *p.* 119.—*Heaths and moors.*

3. MENZIESIA.

Cal. deeply 5-cleft. *Cor.* ovate, 4—5-cleft. *Stam.* 8—10. *Anthers* awnless. *Caps.* 4—5-celled, the *partitions* formed by the inflexed *margins* of the *valves*.

1. M. *cærulea*, leaves scattered numerous linear toothed, flower-stalks terminal aggregate simple, flowers 5-cleft decandrous. *p.* 126.—*Mountains.*

4. AZALEA.

Cor. campanulate, 5-cleft, unequal. *Stam.* 5, inserted upon the *receptacle*.

1. A. *procumbens*[a], stems spreading procumbent, leaves opposite elliptical glabrous, their margins revolute. *p.* 73.—*Dry heathy ground.*

5. ANDROMEDA.

Cal. deeply 5-cleft. *Cor.* ovate. *Stam.* 10. *Anth.* with two horns. *Caps.* superior, 4—5-celled, the partitions from the middle of the valves.

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[a] This plant has, with much propriety, been separated from the true *Azaleæ* by M. Desvaux in the *Journal de Botanique*, and under the name of *Loiseleuria* the following character has been attributed to it: " *Cal.* 5-partite, its *segments* equal. *Cor.* subcampanulate, 5-fid, unequal. *Stam.* 5, inserted at the base of the *cor.*, straight, included. *Anth.* opening longitudinally. *Style* erect, included. *Caps.* 2-celled, opening at the extremity. *Flowers* terminal, cymose, with a broad *bractea*."

1. A. *polifolia,* leaves alternate lanceolate, their margins revolute glaucous beneath, flowers on short racemes terminal. *p.* 125.—*Peat bogs.*

6. ARBUTUS.

Cal. 5-cleft. *Cor.* ovate, its base pellucid. *Stam.* 10. *Berry* 5-celled.

1. A. *alpina,* stem procumbent, leaves rugose serrated. *p.* 126. —*Mountains.*
2. A. *Uva Ursi,* stems procumbent, leaves entire (evergreen). *p.* 126.—*Heathy, rocky places.*

ORDER XXIX. VACCINEÆ. *Decand. Théorie, ed.* 1. 216.

(*Ericeæ, part of, Juss.*)

Cal. adherent, persistent, 4—5-cleft. *Corolla* monopetalous, perigynous, 4—5-cleft, deciduous. *Stamens* definite, epigynous. *Anthers* 2-celled, emitting their pollen through a pore or cleft. *Ovary* 5-celled. *Ovules* many. *Style* 1. *Stigma* simple or toothed. *Berry* many-seeded, crowned by the persistent *calyx.* *Seeds* minute, attached to central receptacles. *Embryo* cylindrical, in the axis of a fleshy *albumen.*

Shrubs. *Leaves* alternate, shining, entire, without stipules. *Flowers* usually racemose; sometimes solitary.

1. VACCINIUM.

Cal. adherent, 4-dentate. *Cor.* campanulate, 4-fid. *Stam.* 8. *Anthers* with 2 pores. *Berry* globose, 4-celled, many-seeded.

* *Leaves deciduous.*

1. V. *Myrtillus,* peduncles 1-flowered, leaves serrate ovate deciduous, stem angular. *p.* 118.—*Woods and heathy places.*
2. V. *uliginosum,* peduncles 1-flowered, leaves obovate entire veined deciduous, stems rounded. *p.* 118.—*Highlands.*

** *Leaves persistent, evergreen.*

3. V. *Vitis Idæa,* racemes terminal drooping, leaves evergreen obovate dotted beneath, their margins revolute nearly entire. *p.* 118.—*Heaths, mountains, and woods.*
4. V. *Oxycoccos,* flowerstalks terminal single-flowered, leaves ovate evergreen glaucous beneath, their margins revolute and entire, cor. 4-partite revolute, stem filiform. *p.* 119.—*Peat bogs.*

ORDER XXX. MONOTROPEÆ. *Nutt. Gen.* 1. 272.

Calyx inferior, 5-leaved or none. *Corolla* monopetalous or polypetalous. *Stamens* double the number of the segments of the *cor.*, hypogynous. *Ovary* 4—5-celled, many-seeded. *Style* one. *Stigma* obscurely 4—5-lobed. *Capsule* 4—5-celled, 4—5-valved; valves bearing the dissepiments in the middle. *Seeds* very numerous and minute, winged. *Embryo* very minute at one end of a fleshy *albumen.*

Herbs often destitute of verdure. *Flowers* in racemes, nodding.

1. PYROLA.

Cal. minute, 5-cleft. *Cor.* deeply 5-partite, almost of 5 petals. *Stam.* 10. *Anthers* opening with 2 pores. *Caps.* 5-celled. *Seeds* numerous, invested with a long arillus.

* *Stalk with a single flower.*

1. P. *uniflora,* stalks bearing a solitary flower, leaves suborbicular. *p.* 127.—*Fir woods, rare.*

** *Flowers racemed, secund.*

2. P. *secunda,* flowers all leaning one way, leaves ovate serrated. *p.* 127.—*Shady woods.*

*** *Flowers racemed, pointing in various directions.*

3. P. *rotundifolia,* leaves obovato-rotundate slightly crenate, style bent down much longer than the ascending stam. *p.* 127.—*Dry woods.*
4. P. *media,* leaves ovato-rotund crenate, stam. erect much shorter than the straight or slightly decurved style, stigma with 5 erect points. *p.* 127.—*Woods.*
5. P. *minor,* leaves ovato-rotundate crenate, stam. erect as long as the very short straight style, stigma large with five divergent rays. *p.* 128.—*Woods.*

2. MONOTROPA.

Perianth single, of 4—5 leaves, cucullate at the base. *Stam.* 8—10. *Anth.* 1-celled, bilabiate. *Caps.* 4—5-celled, 4—5-valved *Seeds* numerous, invested with a long arillus.

1. M. *Hypopitys,* lateral flowers with eight, terminal one with 10, stamens. *p.* 125.—*Beech and fir woods.*

Sect. II. Corolla monopetalous or polypetalous, perigynous (*inserted into the calyx*).

Order XXXI. CAMPANULACEÆ. *Juss.*

Calyx superior, 5-cleft. *Corolla* regular or irregular, 5-cleft. *Stamens* 5, distinct or syngenesious. *Style* simple. *Stigma* 1—2—3-cleft, naked, or surrounded by a ring of hairs. *Disk* epigynous. *Capsule* 2—3—5-celled, bursting either at the summit or by the sides. *Seeds* numerous. *Embryo* in the axis or at the end of a fleshy albumen.

Herbs often milky. *Leaves* simple. *Inflorescence* various. *Mirb.*

1. CAMPANULA.

Cal. 5-cleft. *Cor.* campanulate, 5-cleft. *Stam.* 5, with the filaments broader at the base. *Stigma* trifid. *Caps.* 3—5-celled, opening with lateral pores.

1. C. *rotundifolia*, glabrous, radical leaves subrotundo-cordate crenate, cauline ones linear entire. *p.* 74.—*Hilly pastures.*
2. C. *persicifolia*, glabrous, radical leaves obovate lengthened into a petiole, those of the stem linear-lanceolate subserrate sessile remote. *p.* 74.—*Woods, rare.*
3. C. *latifolia*, leaves ovato-lanceolate scabrous toothed, stem quite simple rounded, flowers solitary peduncled erect, calyx glabrous, fruit drooping. *p.* 75.—*Sides of rivulets.*
4. C. *rapunculoides*, leaves cordato-lanceolate scabrous crenate, stem branched, flowers solitary secund drooping axillary forming a spike, segments of the cal. patent. *p.* 75.—*Woods.*
5. C. *Trachelium*, stem angular, leaves petiolate cordato-lanceolate acutely serrated hispid as well as the cal., peduncles few-flowered axillary. *p.* 75.—*Shady places.*
6. C. *glomerata*, stem angular simple nearly smooth, leaves scabrous crenate oblongo-lanceolate, radical leaves petiolate, cauline ones semiamplexicaul, flowers sessile mostly in a terminal cluster. *p.* 75.—*Dry mountainous pastures.*
7. C. *hederacea*, stem lax filiform, leaves all cordate angulato-dentate glabrous. *p.* 75.—*Moist shady places.*

2. JASIONE.

Cal. 5-cleft. *Cor.* rotate, 5-cleft. *Stam.* 5. *Anthers* united at the base. *Stigma* clavate. *Caps.* 2-celled, opening at the top. (*Flowers* aggregate on a common receptacle and surrounded by an involucre.)

1. J. *montana.* *p.* 76.—*Dry hilly pastures.*

3. LOBELIA.

Cor. irregular, cleft longitudinally on the upper side, two-lipped. *Stam.* 5. *Anthers* united into a tube. *Caps.* 2—3-celled.

1. L. *Dortmanna*, leaves linear 2-celled entire, scape nearly naked, flowers racemed. *p.* 76.—*Margins of lakes.*

ORDER XXXII. COMPOSITÆ. *Linn.*

Calyx adherent with the *ovary*, the limb entire or toothed, or mostly expanded into a pappus which crowns the fruit. *Cor.*

regular or irregular, its divisions edged with a nerve. *Stamens* 5, syngenesious. *Ovary* one. *Style* one, sheathed by the tube of the anthers. *Stigma* simple or bifid. *Fruit* an achenium. *Seed* erect, without albumen. *Embryo* straight. *Radicle* opposite the hilum.

Stems (in the British genera) herbaceous. *Leaves* opposite or alternate. *Flowers* capitate, inserted into a broad receptacle and surrounded by an involucre.

Div. I. Cichoraceæ. *All the florets ligulate and perfect.*

1. TRAGOPOGON.

Involucre simple, of many leaves. *Receptacle* naked. *Pappus* feathery, stipitate. *Pericarps* longitudinally striated.

1. Tr. *pratensis*, involucre about as long as the cor., leaves undivided glabrous acuminated channelled, peduncles cylindrical. *p.* 226.—*Pastures.*
2. Tr. *porrifolius*, involucre much longer than the cor., leaves undivided straight, peduncle thickened upwards. *p.* 226.—*Meadows, rare.*

2. PICRIS.

Cal. double, the inner segments equal, the outer lax. *Receptacle* naked. *Pappus* feathery. *Pericarps* transversely striated. (*Picris and Helminthia, Decand.*)

1. P. *hieracioides*, exterior scales of the involucre short lax, leaves very rough lanceolate toothed, stem scabrous, pappus sessile. *p.* 226.—*Road-sides.*

3. SONCHUS.

Involucre imbricated, swelling at the base. *Receptacle* naked. *Pappus* simple, sessile.

1. S. *cæruleus*, "peduncles and involucre hispid racemose, leaves sublyrate, terminal lobe deltoid very large," *Sm. p.*226.—*Alps.*
2. S. *arvensis*, peduncles and involucre hispid subumbellate, leaves runcinate dentato-ciliate cordate at the base. *p.* 226.—*Corn-fields.*
3. S. *oleraceus*, peduncles subtomentose umbellate, involucre glabrous, leaves runcinate dentato-ciliate amplexicaul at the base. *p.* 227.—*Waste places.*

4. LACTUCA.

Involucre imbricated, cylindrical; its scales with a membranous margin. *Receptacle* naked. *Pappus* simple, stipitate.

1. L. *virosa*, leaves oblong toothed horizontal, their keel prickly, their apex obtuse. *p.* 227.—*Banks, rare.*

5. PRENANTHES.

Involucre with scales at the base. *Receptacle* naked. *Pappus* simple, sessile. *Florets* few.

1. Pr. *muralis*, florets 5, leaves lyrato-pinnatifid and toothed, the terminal lobe with about 5 angles. *p.* 227.—*Walls, &c.*

6. LEONTODON.

Involucre imbricated with scales that are frequently lax and flaccid. *Receptacle* naked. *Pappus* simple, stipitate.

1. L. *Taraxacum*, outer scales of the involucre reflexed, leaves runcinate glabrous toothed. *p.* 227.—*Pastures.*
2. L. *palustre*, outer scales of the involucre erect appressed, leaves sinuato-dentate nearly glabrous. *p.* 227.—*Marshes.*

7. APARGIA.

Involucre imbricated, with scales at the base. *Receptacle* naked, dotted. *Pappus* feathery, sessile, unequal.

1. A. *hispida*, scape single-flowered, leaves dentate scabrous, florets hairy at their orifice glandular at the tip. *p.* 228.—*Meadows.*
2. A. *hirta*, scape single-flowered, leaves dentate scabrous, involucre nearly glabrous, outer pericarps with a scaly pappus. *p.* 228.—*Dry pastures.*
3. A. *Taraxaci*, scape single-flowered thickened upwards, leaves glabrous runcinato-dentate, involucre very hairy. *p.* 228.—*Mountains.*
4. A. *autumnalis*, scape branched scaly upwards, leaves lanceolate toothed or pinnatifid subglabrous, peduncles swelling beneath the involucre. *p.* 228.—*Pastures.*

8. HIERACIUM.

Involucre ovate, imbricated. *Receptacle* nearly naked, dotted. *Pappus* simple, sessile.

* *Scape naked (or rarely with one leaf), single-flowered.*

1. H. *alpinum*, scape 1-flowered, leaflets hairy as well as the oblongo-lanceolate entire leaves, involucre thickly covered all over with long silky hairs. *p.* 228.—*Rocks or mountains.*
2. H. *Halleri*, scape 1-flowered with 1 or rarely 2 leaves hairy as well as the spathulato-lanceolate toothed leaves, involucre with rather long silky hairs principally near the margins of the scales. *p.* 229.—*Mountains.*
3. H. *Pilosella*, scape 1-flowered naked, leaves entire elliptico-lanceolate hairy downy beneath, scions creeping. *p.* 229.—*Banks.*

** *Scape naked (or rarely with a single leaf), many-flowered.*

4. H. *dubium*, scape many-flowered naked (or with one small leaf),

leaves entire elliptico-lanceolate with only a few scattered hairs, scions creeping. *p.* 229.—*Banks?*

5. H. *aurantiacum*, scape nearly naked simple hairy bearing a corymb of many flowers, leaves obovato-lanceolate entire rough with longish hairs. *p.* 229.—*Woods.*

*** *Scape with few* (1—2) *leaves, many-flowered.*

6. H. *Lawsoni*, stem more or less branched upwards where it is the most hairy and the hairs mixed with black glands having 1—2 sessile leaves, radical leaves ovato-lanceolate petiolate entire or toothed towards the base hairy especially on the petioles, involucres with hairs which are black at the base mixed with black pedunculated glands. *p.* 230.—*Alps.*
7. H. *murorum*, stem branched upwards subcorymbose downy especially beneath the involucre, where are a few black glands, having 1 petiolated leaf, radical leaves ovate or lanceolate entire or dentate at the base hairy, as well as the longish petioles, involucre downy. *p.* 230.—*Woods and rocks.*

**** *Stem with many leaves, many-flowered.*

8. H. *sylvaticum*, stem many-leaved branched upwards and subcorymbose slightly hairy and more or less downy beneath the involucre, leaves ovato-lanceolate or lanceolate toothed with the sharp teeth pointing upward somewhat hairy, involucre with very short pubescence. *p.* 231.—*Mountain woods.*
9. H. *denticulatum*, " stem erect many-flowered solid, leaves sessile elliptic-lanceolate finely toothed smoothish glaucous beneath, flowerstalks glandular and cottony," *Sm. p.* 231.—*Banks.*
10. H. *molle*, stem panicled fistulose, leaves lanceolate obsoletely toothed semiamplexicaul, lower ones petiolate very obtuse. *p.* 232.—*Woods.*
11. H. *paludosum*, glabrous, stem panicled fistulose, leaves ovato-oblong acute toothed embracing the stem with their heart-shaped base, scales of the involucre with black hairs or bristles. *p.* 232.—*Wet places.*
12. H. *cerinthoides*, stem corymbose hairy above, leaves hairy very slightly toothed, radical ones oblongo-obovate petiolate, cauline ones oblong semiamplexicaul, involucre hairy. *p.* 232. —*Rocks.*
13. H. *amplexicaule*, glanduloso-pilose, stem corymbose, leaves toothed, radical ones oblongo-ovate petiolate, cauline ones cordate at the base amplexicaul. *p.* 232.—*Walls and rocks.*
14. H. *prænanthoides*, " stem erect many-flowered, leaves amplexicaul somewhat toothed rough at the margin, lower ones oblong, peduncles downy," *Sm. p.* 232.—*Banks.*

15. H. *sabaudum*, "stem erect many-flowered, leaves ovato-lanceolate dentato-serrate half embracing the stem hairy beneath, the lower ones elliptico-lanceolate," *Sm. p.*233 --*Rocky places.*
16. H. *umbellatum*, stem erect simple very leafy, leaves linear-lanceolate subglabrous slightly toothed, flowers subumbellate, peduncles downy, involucres glabrous. *p.* 233.—*Stony places.*

9. CREPIS.

Involucre surrounded with deciduous scales and at length swelling into protuberances. *Receptacle* roughish. *Pappus* sessile.

1. C. *pulchra*, "leaves pubescent toothed those on the stem subsagittate, stem panicled corymbose, involucre pyramidal glabrous," *Sm. p.* 233.—*Rocks.*
2. C. *tectorum*, leaves glabrous runcinate, the upper ones linear-sagittate amplexicaul, stem glabrous, panicle subcorymbose, involucre pubescent. *p.* 233.—*Pastures.*

10. HYPOCHÆRIS.

Involucre oblong, imbricated. *Receptacle* chaffy. *Pappus* feathery, stipitate or sessile.

1. H. *maculata*, stem almost leafless solitary, leaves ovato-oblong undivided toothed (spotted above). *p.* 234.—*Woods.*
2. H. *glabra*, nearly glabrous, involucre oblong imbricated, stem branched somewhat leafy, radical leaves dentato-sinuate. *p.* 234. —*Dry pastures.*
3. H. *radicata*, stem branched leafless glabrous, peduncles with small scales, leaves runcinate obtuse scabrous. *p.*234—*Pastures.*

11. LAPSANA.

Involucre with scales at the base. *Receptacle* naked (its inner leaves equal, channelled, *Sm.*). *Pericarps* destitute of pappus (deciduous).

1. L. *communis*, involucre of the fruit angular, stem panicled, peduncles slender, leaves ovate petiolate angulato-dentate. *p.* 234.—*Waste places.*
2. L. *minima*, scape branched very thick and fistulose upwards, leaves obovato-oblong toothed. *p.* 234.—*Corn-fields.*

12. CICHORIUM.

Involucre surrounded with scales or smaller leaflets. *Receptacle* naked or slightly hairy. *Pappus* sessile, scaly, shorter than the *pericarp.*

1. C. *Intybus*, flowers sessile axillary in pairs, leaves runcinate. *p.* 234.—*Waste places.*

Div. II. Cinarocephalæ. *Corollas all tubular and spreading.*

13. ARCTIUM.

Involucre globose, each of its scales with an incurved hook at the extremity. *Receptacle* chaffy. *Pappus* simple.

1. A. *Lappa*, leaves cordate petiolate. *p.* 235.—*Waste places.*

14. SERRATULA.

Involucre cylindrical, imbricated with scales that are not spinous. *Receptacle* chaffy. *Pappus* roughish or feathery, rigid, persistent.

1. S. *tinctoria*[a], leaves sharply serrated glabrous pinnatifid the terminal lobe the largest, flowers in a small clustered umbel. *p.* 235.—*Woods.*
2. S. *alpina*, leaves ovato-lanceolate attenuated at the base undivided toothed cottony beneath, involucre hairy, flowers in a clustered umbel. *p.* 235.—*Alpine rocks.*

15. CARDUUS.

Involucre swelling, imbricated with spinous scales. *Receptacle* hairy. *Pappus* deciduous, roughish.

* *Leaves decurrent.*

1. C. *nutans*, leaves decurrent spinous, flowers drooping, scales of the involucre lanceolate cottony, outer ones spreading. *p.* 235.—*Waste places.*
2. C. *acanthoides*, leaves decurrent sinuated spinous, involucre globose nearly sessile, its scales linear slightly recurved. *p.* 236.—*Way-sides.*
3. C. *tenuiflorus*, leaves decurrent sinuated spinous somewhat cottony beneath, involucres nearly cylindrical clustered sessile, their scales lanceolate erect. *p.* 236.—*Waste places.*

** *Leaves sessile.*

4. C. *marianus*, leaves amplexicaul waved spinous, the radical ones pinnatifid, scales of the involucre subfoliaceous recurved spinous at the margin. *p.* 236.—*Waste places.*

16. CNICUS.

Involucre swelling, imbricated with spinous scales. *Receptacle* hairy. *Pappus* deciduous, feathery.

* *Leaves decurrent.*

1. Cn. *lanceolatus*, leaves decurrent hispid pinnatifid, their segments generally 2-lobed spreading spinous, involucres ovate

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[a] This species is observed, by Mr. Brown in his paper on *Compositæ*, published in the *Linn. Trans.*, to be polygamous. One sex is figured in the *English Botany*, another in *Fl. Danica.*

tomentose, their scales lanceolate spreading. *p.* 236.—*Waysides.*

2. Cn. *palustris*, leaves decurrent scabrous pinnatifid spinous, involucres ovate clustered, their scales ovato-lanceolate mucronate appressed. *p.* 236.—*Meadows.*

** *Leaves sessile.*

3. Cn. *arvensis*, leaves sessile pinnatifid spinous, stem panicled, involucre ovate, scales appressed mucronated. *p.* 237.—*Fields.*
4. Cn. *eriophorus*, leaves sessile pinnatifid every other segment pointing upwards spinous scabrous, involucres sphærical woolly. *p.* 237.—*Road-sides.*
5. Cn. *heterophyllus*, leaves amplexicaul lanceolate ciliato-dentate undivided or laciniated white and downy beneath, flowers mostly solitary. *p.* 237.—*Marshy places in the mountains.*
6. Cn. *pratensis*, leaves sessile lanceolate waved at the edge and unequally spinous pubescent cottony beneath, flowers mostly solitary. *p.* 237.—*Pastures.*
7. Cn. *acaulis*, stemless, involucre glabrous. *p.* 237.—*Dry pastures.*

17. ONOPORDUM.

Involucre swelling, its scales spreading and spinous. *Receptacle* cellular. *Pappus* deciduous, rough.

1. O. *Acanthium*, scales of the involucre spreading subulate, leaves ovato-oblong sinuated and spinous decurrent woolly on both sides. *p.* 238.—*Waste places.*

18. CARLINA.

Involucre swelling, the *ext. scales* with numerous spines; the *inner ones* coloured, scariose. *Receptacle* chaffy. *Pappus* feathery.

1. C. *vulgaris*, stem many-flowered corymbose pubescent, leaves lanceolate unequally spinous and sinuated downy beneath. *p.* 238.—*Dry hills.*

19. CENTAUREA.

Involucre scaly. *Receptacle* bristly. *Corollas* of the ray sterile, infundibuliform, irregular, longer than those of the disk. *Pappus* simple.

1. C. *Jacea*, scales of the involucre scariose torn, the lower ones pinnatifid, leaves linear lanceolate, the lower ones broader and toothed. *p.* 248.—*Woods and pastures, rare.*
2. C. *nigra*, scales of the involucre ovate ciliated with capillary teeth, lower leaves angulato-lyrate, upper ones ovate. *p.* 248.—*Pastures.*
3. C. *Cyanus*, scales of the involucre serrated, leaves linear entire the lowermost toothed. *p.* 249.—*Cornfields.*
4. C. *Scabiosa*, scales of the involucre ciliated ovate pubescent,

leaves pinnatifid roughish, the segments lanceolate acute. *p.*249. —*Pastures and fields.*

DIV. III. CORYMBIFERÆ. *Florets all tubular, erect and parallel, or with those of the circumference ligulate.*

1. DISCOIDEI. *Florets tubular, erect, crowded, parallel, nearly plane at the top.*

20. BIDENS.

Involucre of many *leaves,* with many foliaceous *bracteas* at the *base. Receptacle* plane, chaffy. *Cor.* sometimes radiant. *Pericarps* crowned with from 2—5 persistent *awns,* which are rough with minute deflexed *bristles.*

1. B. *cernua,* flowers drooping, bracteas lanceolate entire (longer than the involucre), leaves lanceolate serrated undivided, bristles of the pericarp about 4 erect. *p.* 238.—*Sides of ditches.*
2. B. *tripartita,* leaves tripartite, leaflets lanceolate deeply serrated, bristles of the pericarp 2—3. *p.* 238.—*Marshes.*

21. EUPATORIUM.

Involucre imbricated, oblong. *Florets* few. *Receptacle* naked. *Pappus* rough.

1. E. *cannabinum,* leaves opposite subpetiolate tri-quinque-partite, their segments lanceolate deeply serrated. *p.* 238.—*River-banks.*

22. TANACETUM.

Involucre hemisphærical, imbricated. *Receptacle* naked. *Florets* of the *ray* trifid, obsolete, sometimes wanting. *Pericarps* crowned with a membranous *margin* or *pappus.*

1. T. *vulgare,* leaves bipinnatifid inciso-serrate. *p.* 239.—*Borders of fields.*

23. ARTEMISIA.

Involucre ovate or rounded, imbricated. *Receptacle* naked (or downy, *Sm.*). *Florets* of the *ray* subulate. *Pericarps* crowned with a membranaceous *pappus.*

1. A. *maritima,* " leaves downy pinnated, the uppermost undivided, racemes drooping, receptacle naked, flowers oblong sessile," *Sm.* *p.* 239.—*Sea-shore.*
2. A. *gallica,* " leaves downy pinnated, radical ones capillary, upper ones undivided, racemes erect, receptacle naked, flowers oblong, "*Sm.* *p.* 239.—*Sea-shore.*
3. A. *Absinthium,* leaves bi-tripinnatifid clothed with short silky down, segments lanceolate, flowers hemisphærical drooping, receptacle hairy. *p.* 239.—*Way-sides.*
4. A. *vulgaris,* leaves pinnatifid, their segments cut downy beneath, flowers somewhat racemed ovate, receptacle naked. *p.* 240.—*Waste places.*

24. GNAPHALIUM.

Involucre imbricated, with (often) coloured membranous scales. *Receptacle* naked. *Florets* of the *ray* subulate; some of the *disk* occasionally abortive. *Pappus* rough.

* *Flowers diœcious.*

1. Gn. *dioicum*, shoots procumbent, stems simple, corymbs crowded, radical leaves spathulate, flowers diœcious, inner scales of the involucre elongated obtuse coloured. *p.* 240.—*Mountain heaths.*

** *Flowers perfect.*

2. Gn. *sylvaticum*, stem simple nearly erect downy, flowers axillary forming a distant leafy spike, leaves linear lanceolate downy. *p.* 240.—*Dry subalpine pastures.*
3. Gn. *supinum*, stem decumbent branching only from the base, flowering stems erect, flowers solitary or racemed, leaves linear downy on both sides. *p.* 240.—*Alps.*
4. Gn. *uliginosum*, stem very much branched diffuse woolly, leaves linear lanceolate downy, flowers in terminal crowded clusters which are shorter than the leaves. *p.* 240.—*Wet places.*
5. Gn. *gallicum*, stem erect dichotomous, leaves linear acuminate downy, flowers crowded axillary and terminal, clusters much shorter than the leaves. *p.* 240.—*Dry banks.*
6. Gn. *minimum*, stem erect branched, branches spreading, leaves lanceolate acute cottony, flowers conical clustered lateral and terminal, clusters longer than the leaves. *p.* 241.—*Sandy hills.*
7. Gn. *germanicum*, stem erect proliferous at the summit, leaves lanceolate downy acute, flowers capitate in the axils of the branches and terminal. *p.* 241.—*Sandy ground.*

25. CONYZA.

Involucre roundish, imbricated. *Receptacle* naked. *Florets* of the *ray* 3-cleft. *Pappus* rough.

1. C. *squarrosa*, leaves pubescent ovato-lanceolate serrated, the upper ones entire, stem herbaceous corymbose, scales of the involucre recurved leafy. *p.* 242.—*Dry soils, rare.*

II. Radiati. *Flowers rayed, or with the florets of the circumference ligulate.*

26. ERIGERON.

Involucre imbricated. *Receptacle* naked. *Florets* of the *ray* numerous, very narrow (mostly of a different colour from the *disk*). *Pappus* simple.

1. E. *acre*, peduncles alternate (scarcely racemose) single-flower-

ed, pappus as long as the florets of the ray, leaves lanceolate obtuse. *p*. 242.—*Mountain pastures.*

2. E. *alpinum,* stems with usually only one flower, pappus much shorter than the florets of the ray, leaves lanceolate. *p*. 242. —*Alpine rocks.*

27. TUSSILAGO.

Involucre simple, equal, submembranaceous, swelling. *Receptacle* naked. *Pappus* simple.

* *Flowers rayed. Scape single-flowered.*

1. T. *Farfara,* scape single-flowered imbricated with scales, leaves cordate angular toothed downy beneath. *p*. 242.—*Clayey fields.*

** *Flowers all tubular. Scapes many-flowered.*

2. T. *Petasites,* thyrsus ovato-oblong, leaves cordate unequally toothed with the lobes approximate downy beneath. *p*. 243.—*River-sides.*

28. SENECIO.

Involucre subcylindrical, equal, scaly below; the scales withered at the *tip*. *Receptacle* naked. *Pappus* simple.

* *Florets all tubular.*

1. S. *vulgaris,* leaves semiamplexicaul pinnatifid toothed, flowers in clustered corymbs destitute of a ray. *p*. 243.—*Waste ground.*

** *Flowers rayed, with the ray rolled back.*

2. S. *viscosus,* ray revolute, leaves pinnatifid and viscid, scales of the involucre lax hairy. *p*. 243.—*Hedge banks.*
3. S. *lividus,* " ray revolute, leaves amplexicaul lanceolate pinnatifid and toothed, ovate scales of the involucre very short acute not discoloured," *Sm*. *p*. 243.—*Hilly places, rare.*
4. S. *sylvaticus,* ray revolute, leaves sessile pinnatifid lobed and toothed, scales of the involucre very short glabrous, stem erect straight corymbose. *p*. 244.—*Dry soils.*

*** *Flowers rayed, with the ray patent. Leaves pinnatifid.*

5. S. *Jacobæa,* ray spreading, leaves lyrate bipinnatifid divaricated toothed glabrous, stem erect, pericarps hairy. *p*. 244.—*Waysides.*
6. S. *aquaticus,* ray spreading, leaves lyrate serrated glabrous, the lowermost obovate and undivided, involucre hemisphærical, pericarps glabrous. *p*. 244.—*Wet marshes.*

**** *Flowers rayed. Leaves undivided.*

7. S. *saracenicus,* ray spreading, leaves lanceolate sharply serrated nearly glabrous, corymbs of rather few flowers. *p*. 244. —*Moist pastures.*

29. ASTER.

Involucre imbricated, its lowermost *scales* spreading (except in

A. tripolium). *Receptacle* naked. *Florets* of the *ray* more than 10. *Pappus* simple.

1. A. *Tripolium*, stem glabrous corymbose, leaves linear-lanceolate fleshy obscurely 3-nerved, scales of the involucre lanceolate membranous obtuse imbricated. *p.* 244.—*Salt marshes.*

30. SOLIDAGO.

Involucre imbricated, its *scales* connivent. *Receptacle* naked. *Florets* of the *ray* (of the same colour as the *disk*) about 5. *Pappus* rough.

1. S. *Virgaurea*, cauline leaves lanceolate, the lower ones elliptical, racemes panicled erect crowded. *p.* 245.—*Mountain pastures.*

31. INULA.

Involucre imbricated. *Receptacle* naked. *Florets* of the *ray* very numerous, linear. *Anthers* with 2 *bristles* at the *base.* *Pappus* sometimes simply composed of *hairs*, sometimes double; the *ext.* membranous.

1. I. *Helenium*, leaves amplexicaul somewhat toothed ovate rugged downy beneath, scales of the involucre downy. *p.* 245.—*Waste places about buildings.*
2. I. *dysenterica*, leaves oblongo-cordate amplexicaul rugged downy, stem woolly panicled, scales of the involucre setaceous. *p.* 245.—*Moist places.*
3. I. *crithmoides*, leaves linear fleshy generally 3-pointed. *p.* 245. —*Sea-shore.*

32. DORONICUM.

Scales of the *involucre* in 2 equal rows, longer than the *disk.* *Receptacle* naked. *Pericarps* of the *disk* crowned with a simple *pappus*, those of the *ray* without a *pappus.*

1. D. *Pardalianches*, leaves cordate repando-dentate, radical ones petiolate, cauline ones amplexicaul. *p.* 245.—*Fields and hedges.*

33. BELLIS.

Involucre hemisphærical, its *scales* equal. *Receptacle* naked, conical. *Pappus* none.

1. B. *perennis*, scape naked single-flowered, leaves obovate crenate. *p.* 246.—*Pastures.*

34. CHRYSANTHEMUM.

Involucre hemisphærical, imbricated with *scales* whose *borders* are membranous. *Receptacle* naked. *Pappus* none.

1. Ch. *Leucanthemum*, leaves amplexicaul oblong obtuse cut pinnatifid at the base, radical ones obovate petiolate, stem erect branched. *p.* 246.—*Dry pastures.*
2. Ch. *segetum*, leaves amplexicaul glaucous inciso-serrate above toothed at the base. *p.* 246.—*Corn-fields.*

35. PYRETHRUM.

Involucre hemisphærical, imbricated with *scales* whose *borders* are membranous. *Receptacle* naked. *Pericarps* crowned with a membranous *margin.*

1. P. *Parthenium,* leaves petiolate flat bipinnate, the segments ovate cut, peduncles branched corymbose, stem erect, involucre hemisphærical pubescent. *p.* 246.—*Waste places.*
2. P. *inodorum,* leaves sessile bipinnatifid with the segments capillary, stem branched spreading, pappus entire. *p.* 246.—*Way-sides.*
3. P. *maritimum,* leaves bipinnatifid, the segments linear fleshy awnless, stem diffuse branched, pappus lobed. *p.* 246.—*Sea-coast.*

36. MATRICARIA.

Involucre hemisphærical or almost plane, imbricated with *scales* whose *borders* are membranous. *Receptacle* naked, almost cylindrical. *Pappus* none.

1. M. *Chamomilla,* leaves glabrous bipinnatifid the segments capillary, involucre nearly plane its scales obtuse. *p.* 246.—*Waste grounds.*

37. ANTHEMIS.

Involucre hemisphærical; its *scales* nearly equal, their *margins* scariose. *Receptacle* convex, chaffy. *Pericarps* crowned with a membranous *border* or *pappus.*

1. A. *nobilis,* leaves bipinnate, the segments linear subulate a little downy, scales of the receptacle membranous scarcely longer than the disk. *p.* 247.—*Waste places.*
2. A. *arvensis,* leaves bipinnatifid, their segments linear lanceolate pubescent, receptacle conical, its scales lanceolate, pericarps crowned with an entire pappus. *p.* 247.—*Corn-fields.*
3. A. *Cotula,* leaves bipinnatifid glabrous, their segments subulate, receptacle conical, its scales setaceous. *p.* 247.—*Waste places.*
4. A. *tinctoria,* leaves bipinnatifid serrated downy beneath, stem erect branched subcorymbose. *p.* 247.—*Road-sides.*

38. ACHILLEA.

Involucre ovate, imbricated, unequal. *Receptacle* plane, chaffy. *Florets* of the *ray* 5—10, roundish-obcordate. *Pericarps* naked.

* *Flowers white, or rarely reddish.*

1. A. *Ptarmica,* leaves linear lanceolate acuminate sharply serrated. *p.* 248.—*Pastures.*
2. A. *Millefolium,* leaves bipinnate slightly hairy, their segments linear toothed acute, stems furrowed. *p.* 248.—*Way-sides.*

** *Flowers yellow.*

3. A. *tomentosa*, leaves bipinnatifid woolly, the segments crowded linear acute, corymbs repeatedly compound. *p.* 248.—*Hilly pastures.*

ORDER XXXIII. DIPSACEÆ. *Juss.*

Cal. adherent with the *ovary*, naked or calyculated. *Cor.* regular or irregular, 4—5-cleft. *Anthers* free. *Ovary* 1. *Style* simple. *Stigma* simple or trifid. *Pericarp* indehiscent, 1-celled, 1-seeded. *Seed* pendulous. *Embryo* straight, surrounded by a thin *albumen.*

Stems herbaceous. *Leaves* usually opposite, sometimes whorled. *Flowers* generally capitate. *Receptacle* paleaceous. *Mirb.*

1. DIPSACUS.

Involucre many-leaved. *Cal.* double; *ext.* very minute; *int.* cup-shaped, entire. *Cor.* 4-lobed. *Stam.* 4. *Receptacle* chaffy, spinous. *Pericarp* angular, crowned with the double *cal.*

1. D. *Fullonum*, leaves subconnate, scales of the receptacle hooked at the extremity, involucres spreading (reflexed, *Sm.*). *p.* 49.—*Waste places, rare.*
2. D. *sylvestris*, leaves opposite rarely connate, scales of the receptacle straight, involucres curved upward. *p.* 49.—*Waste places.*
3. D. *pilosus*, leaves petiolate with a small leaflet at the base on each side, involucres short deflexed. *p.* 49.—*Hedges.*

2. SCABIOSA.

Involucre many-leaved. *Cal.* double, variously cut. *Cor.* 4—5-lobed. *Stam.* 4-5. *Receptacle* chaffy or naked. *Pericarp* crowned with the enlarged double *cal.*, of which the *ext.* is membranaceous; the *int.* feathery or bristly.

1. S. *succisa*, corollas 4-cleft, their segments equal, cauline leaves subdentate, head of flowers nearly globose. *p.* 49.—*Pastures.*
2. S. *arvensis*, corollas 4-cleft radiating, stem hispid branched, stem-leaves pinnatifid (often) cut. *p.* 50.—*Corn-fields.*
3. S. *columbaria*, corollas 5-cleft radiating, stem hairy, radical leaves oblongo-ovate and crenate or lyrate, those of the stem pinnatifid with linear segments. *p.* 50.—*Dry pastures.*

ORDER XXXIV. VALERIANEÆ. *Decand.*

Cal. adherent with the *ovary*, sometimes pappose and rolled inwards, sometimes toothed and erect. *Cor.* tubular, 5-lobed, generally irregular. *Stam.* 1—5. *Anth.* distinct. *Style* 1. *Stigma* 1—3. *Pericarp* indehiscent, 1—3-celled, 1—3-seeded. *Seeds* pendulous. *Embryo* straight, without *albumen*.

Herbs. *Leaves* opposite. *Flowers* in *corymbs* or *panicles*. *Decand.*

1. VALERIANA.

Cal. with its *limb* involute, at length unfolding into a feathery *pappus*. *Cor.* 5-cleft, gibbous or spurred on one side at the base. *Stam.* 1—3; sometimes 2 abortive. *Pericarp* crowned with the feathery *pappus*. *Seed* 1.

* *Cor. spurred.* *Stam.* 1. (Centranthus.)

1. V. *rubra*, leaves ovato-lanceolate. *p.* 14.—*Walls.*

** *Cor. gibbous at the base.* *Stam.* 3. (Valeriana, *Decand.*)

2. V. *officinalis*, leaves all pinnated, leaflets lanceolate nearly uniform serrated. *p.* 15.—*Marshy places.*
3. V. *pyrenaica*, leaves dentato-serrate heart-shaped petiolate, upper ones with one or two pair of small lanceolate leaflets. *p.* 15.—*Woods, rare.*
4. V. *dioica*, flowers diœcious, radical leaves spathulato-ovate undivided, stem leaves pinnatifid. *p.* 15.—*Marshes.*

2. FEDIA.

Cal. toothed. *Cor.* 5-cleft, gibbous on one side at the base. *Stam.* 2. *Pericarp* 3-celled, 2 of the *cells* generally abortive.

1. F. *olitoria*, fruit tridentate ovato-rotundate inflated glabrous, flowers capitate. *p.* 15.—*Corn-fields.*
2. F. *dentata*, fruit subtridentate obpyriform glabrous, flowers corymbose with a single flower between the upper divisions of the stem. *p.* 15.—*Banks and fields.*

ORDER XXXV. RUBIACEÆ.

(SECT. I. *of Rubiaceæ. Juss.*)

Cal. adherent with the *ovary*, entire or toothed at the margin. *Cor.* regular, 4—5-lobed. *Stam.* 4—5 between the divisions of the *cor.* *Ovary* 1. *Style* 2-partite or bifid. *Stigma* double. *Disk* epigynous, composed of 2 semicircular *glands*. *Pericarp* dicoccous, 2-seeded; the *cocci* indehiscent and separating from a central *receptacle*. *Seeds* peltate. *Embryo* buried in the axis of a corneous albumen. *Radicle* inferior.

Herbs with whorled entire *leaves*. *Flowers* axillary and terminal. *Mirb.*

1. SHERARDIA.

Cor. infundibuliform, 4-fid. *Fruit* crowned with the segments of the *cal.*

1. S. *arvensis*, leaves about 6 in a whorl, flowers terminal sessile umbellate. *p.* 51.—*Corn-fields.*

2. ASPERULA.

Cor. infundibuliform, 3—4-fid. *Fruit* not crowned with the segments of the *cal.*

1. A. *odorata*, leaves about 8 in a whorl lanceolate, flowers paniculate on longish stalks. *p.* 50.—*Woods.*

3. GALIUM.

Cor. rotate, 4-cleft. *Fruit* a dry *Nut*, crowned with the segments of the *cal.*

* *Fruit glabrous. Flowers yellow.*

1. G. *verum*, leaves about 8 in a whorl linear grooved, flowers in dense panicles. *p.* 50.—*Banks.*
2. G. *cruciatum*, leaves 4 in a whorl ovate hairy, flowers polygamous clustered lateral, peduncles 2-leaved. *p.* 51.—*Hedges.*

** *Fruit glabrous. Flowers white.*

3. G. *palustre*, leaves 4—6 in a whorl oblongo-lanceolate obtuse unequal in size, stem lax spreading branched, branches patent. *p.* 51.—*Sides of lakes, &c.*
4. G. *Witheringii*, " leaves about 5 in a whorl reflexed (horizontal in fig. in *E. B.*) lanceolate aristate ciliated, stem nearly erect simple scabrous." *p.* 51.—*Woods and hills.*
5. G. *uliginosum*, leaves 6 in a whorl lanceolate mucronate, the margins rough with reflexed prickles. *p.* 51.—*Ditch banks.*
6. G. *saxatile*, leaves 6 in a whorl obovate mucronate, stem very much branched procumbent glabrous. *p.* 51.—*Hills and heaths.*
7. G. *erectum*, leaves about 8 in a whorl lanceolate mucronate, their margins rough with prickles pointing forwards, panicle much branched trichotomous, stem glabrous flaccid. *p.* 52.—*Banks.*
8. G. *diffusum*, " leaves about 8 in a whorl linear aristate glabrous, their margins obsoletely serrated" (rough with prickles pointing forwards) " panicle corymbose, stems diffuse very much branched." *p.* 52.—*Banks?*
9. G. *verrucosum*, leaves 6 in a whorl lanceolate, their margins rough with prickles pointing forwards, peduncles axillary 3-flowered, fruit warted drooping. *p.* 52.—*Corn-fields.*
10. G. *spurium*, leaves 6—8 in a whorl, their margins as well as the stem rough with reflexed prickles, peduncles axillary many-flowered, fruit smooth spreading. *p.* 52.—*Corn-fields.*

11. G. *pusillum*, " leaves about 8 in a whorl linear-lanceolate mucronate entire subpubescent, peduncles dichotomous, fruit very smooth." *p.* 52.—*Hilly pastures.*
12. G. *Mollugo*, leaves about 8 in a whorl elliptical mucronate rough at the margin, flowers panicled spreading. *p.* 53.—*Hedges.*

** *Fruit hispid.*

13. G. *boreale*, leaves 4 in a whorl lanceolate 3-nerved glabrous, stems erect, fruit muricated. *p.* 53.—*Banks and rocks.*
14. G. *Aparine*, leaves 6—8 in a whorl linear-lanceolate hispid, their margins, keel, and the stem rough with reflexed prickles, stem weak, fruit hispid. *p.* 53.—*Hedges.*

ORDER XXXVI. CAPRIFOLIACEÆ[a]. *Juss.*

Cal. adherent with the *ovary*, generally with *bracteæ* at its base. *Cor.* various; its *tube* either long and slender, or very short, sometimes polypetalous. *Stam.* 4—5, between the *segments*. *Ovary* 1. *Style* simple or none. *Stigmas* 1—3. *Berry*, *Capsule*, or *Drupe*, with one or more cells. *Seeds* pendulous. *Embryo* in the base or axis of a fleshy albumen. *Rudicle* superior.

Herbs, *Shrubs*, or *Trees*. *Inflorescence* various. *Leaves* almost always opposite. *Mirb.*

* *Cal. bracteated. Style simple. Cor. monopetalous.*

1. LINNÆA.

Cal. 5-cleft, surrounded at the base with a persistent involucre of 2 leaves. *Cor.* campanulate, 5-cleft, equal. *Stam.* 4, 2 shorter. *Berry* dry, 3-celled, only 1 bearing a single perfect *seed.*

1. L. *borealis*. *p.* 190.—*Fir woods.*

2. LONICERA.

Cal. 5-toothed. *Cor.* tubular, campanulate or infundibuliform, 5-cleft, irregular. *Stam.* 5. *Berry* 1-, 2-, 3-celled; *cells* many-seeded.

1. L. *Caprifolium*, flowers ringent whorled terminal sessile, upper leaves connato-perfoliate. *p.* 80.— *Woods, rare.*
2. L. *Periclymenum*, flowers ringent capitate terminal, leaves all distinct. *p.* 80.—*Woods and hedges.*

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[a] This is perhaps the most unnatural of all Jussieu's orders; and it will certainly be eventually much altered. Mr. Brown has already proposed *Lonicereæ*, containing *Lonicera*, *Linnæa*, &c., as a separate order; an arrangement which would gladly have been adopted here, had any characters been published.

*** Cal. bracteated. Style none. Stigmas 3. Cor. monopetalous.*

3. VIBURNUM.

Cal. small, 5-fid. *Cor.* of 1 petal 5-lobed. *Stam.* 5. *Berry* 1-seeded.

1. V. *Lantana*, leaves elliptico-cordate serrate veiny downy beneath. *p.* 96.—*Woods.*
2. V. *Opulus*, leaves glabrous 3-lobed acuminate and serrate, petioles with glands. *p.* 96.—*Woods.*

4. SAMBUCUS.

Cal. very small, 5-fid. *Cor.* rotate, 5-lobed. *Stam.* 5. *Berry* 1-celled, 3-seeded.

1. S. *Ebulus*, cymes with 3 principal branches, leaflets lanceolate, stipules foliaceous, stem herbaceous. *p.* 96.—*Way-sides.*
2. S. *nigra*, cymes with 5 principal branches, leaflets ovate, stem arboreous. *p.* 96.—*Woods and hedges.*

**** Cal. without bracteæ. Style 1. Cor. polypetalous.*

5. HEDERA.

Cal. 5-toothed. *Petals* 5. *Stam.* 5 alternate with the petals. *Berry* 5-seeded, crowned with the segments of the *cal.*

1. H. *Helix*, leaves 5-lobed the lobes angular, floral leaves ovate, the umbel erect. *p.* 82.—*Trunks of trees and rocks.*

6. CORNUS.

Cal. 4-toothed. *Pet.* 4. *Stam.* 4 alternate with the petals. *Drupe* not crowned; its *nut* with 2 cells; *cells* 2-seeded.

1. C. *sanguinea*, arborescent, branches straight, leaves opposite ovate green on both sides, cymes destitute of involucre. *p.* 55. —*Woods.*
2. C. *suecica*, herbaceous, leaves all opposite ovate glabrous, flowers few umbellate surrounded by a 4-leaved involucre and springing from the axil of the forked extremity of the stem. *p.* 55.—*Mountains.*

ORDER XXXVII. LORANTHEÆ. *Juss.*

(*Viscoideæ. Rich.*)

Cal. 1-leaved, adherent with the ovary, usually with another little calyx at its base; or with two bracteæ which supply its place. *Cor.* 0, or polypetalous. *Stam.* attached to the base of the lobes or parts of the cor.; generally equal to them in number; rarely twice as many. *Ovary* surmounted by 1 style and stigma. *Fruit* fleshy or dry with one seed attached to the top of its cell. *Embryo* cylindrical, in the axis of a fleshy albumen, beyond which the superior radicle is exserted.

Shrubs generally parasitical on trees. *Leaves* opposite or sometimes alternate, without stipules. *Flowers* terminal or axillary, solitary or in bunches. *Juss.*

1. VISCUM.

Monœcious or *diœcious*. *Cal.* with the margin entire or a little prominent. *Petals* 4, short, united at the base. *Barren fl. Anth.* 4, sessile, adnate with the petals. *Fertile fl.* *Ovary* crowned with the margin of the cal. *Stigma* 1. *Berry* (*Drupe*) globose, 1-seeded.

1. V. *album*, leaves lanceolate obtuse, stems dichotomous, heads of flowers axillary. *p.* 288.—*On trees, rare.*

ORDER XXXVIII. UMBELLIFERÆ. *Juss.*

Cal. adherent with the ovaries, 5-toothed; teeth generally deciduous, sometimes persistent. *Cor.* of 5 petals, bifid, usually obcordate, with an elongation beyond the sinus of the lobes, often radiating. *Stam.* 5, alternate with the petals, inserted into a thick epigynous disk, sometimes abortive. *Styles* 2. *Stigmas* capitate. *Caryopsides* 2[a], attached to a central stalked receptacle, separating when ripe. *Seed* solitary, pendulous. *Embryo* minute, in the base of a corneous albumen.

Herbs. *Leaves* alternate, generally compound and embracing the stem with their stalk. *Flowers* in umbels.

A. *Umbels with a partial and universal involucre.*

1. ERYNGIUM.

Flowers sessile, capitate. *Receptacle* conical, chaffy. *Fruit* bristly.

1. E. *maritimum*, radical leaves rounded plaited spinous, scales of the receptacle 3-cleft. *p.* 87.—*Sea-coast.*

2. HYDROCOTYLE.

Flowers in a simple umbel or capitate. *Cal.* 0. *Petals* ovate,

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[a] Each fruit has five prominent *ribs* (*costæ*), with as many sunken *intervals* (*valleculæ*) between them. Under the coat of the fruit appear *bands* (*vittæ*) which are ducts or reservoirs traversing the *intervals* longitudinally, and filled with the resinous or oily juices from which the aromatic smell of the fruit is derived. Where the fruit adheres to the receptacle is the *commissure* (*commissura* or *rapha*), which is flat or excavated, occasioned by the cohesion and mutual pressure of the two *caryopsides*, and generally traversed by bands. Upon modifications of these parts the generic characters of Hoffmann and Sprengel are founded, which have recently been applied to all the genera in a masterly manner by the latter author in the 6th vol. of *Römer and Schultes' Species Plantarum.*

acute, equal. *Fruit* without teeth (or calycine segments), suborbicular, laterally compressed, striated.

1. H. *vulgaris*, leaves peltate orbicular crenate, umbels of 5—8 flowers. *p.* 87.—*Boggy places.*

3. SANICULA.

Umbellules clustered, subcapitate, central *flowers* abortive. *Petals* obcordate. *Fruit* clothed with hooked bristles.

1. S. *europæa*, radical leaves simple, flowers all sessile. *p.* 87.—*Woods.*

4. CAUCALIS.

Involucres undivided. *Flowers* radiant, those of the disk abortive. *Fruit* subovate, striated, rough with rigid bristles.

1. C. *Anthriscus*, leaves bipinnate, leaflets ovato-lanceolate, umbels of many close rays, general involucre of many leaves, branches nearly upright. *p.* 87.—*Hedges.*
2. C. *infesta*, leaves pinnate, leaflets lanceolate almost pinnatifid, umbels of many close rays, involucre often wanting, branches spreading. *p.* 87.—*Cornfields.*
3. C. *nodosa*, umbels lateral simple subsessile, stem prostrate. *p.* 88.—*Road-sides.*

5. DAUCUS.

Involucres pinnatifid. *Flowers* somewhat radiant, those of the disk abortive. *Fruit* muricated.

1. D. *Carota*, stem hispid, leaves 2—3-pinnate, leaflets cut linear-lanceolate acute, fruit-bearing umbel concave, fruit bristly. *p.* 88. —*Borders of fields.*

6. BUNIUM.

Partial involucres setaceous (often wanting). *Petals* uniform. *Fruit* oblong, striated, with the interstices tuberculated.

1. B. *Bulbocastanum*, general involucre of scarcely 3 leaves, leaves tripinnate linear glabrous, fruit ovate. *p.* 88.—*Pastures.*

7. CONIUM.

Partial involucres of 3 leaves, all on one side. *Petals* nearly uniform. *Fruit* ovate, tumid, with 5 undulated ribs on each side.

1. C. *maculatum*, seeds without prickles, stem much branched polished and spotted. *p.* 88.—*Banks.*

8. SELINUM.

Involucres, general and *partial*, reflexed. *Petals* heart-shaped, nearly uniform. *Fruit* compressed, striated down the middle.

1. S. *palustre*, lactescent, leaflets pinnatifid, segments linear-lanceolate, stem solitary striated, rays of the umbels pubescent, styles after flowering divaricating. *p.* 88.—*Marshes, rare.*

9. PEUCEDANUM.

Gen. involucre very short. *Flowers* nearly uniform, those of the disk abortive. *Fruit* ovate, compressed, striated, bordered.

1. P. *Silaus*, leaves tripinnate, leaflets linear-lanceolate opposite, general involucres of 1—2 leaves. *p.* 89.—*Road-sides.*

10. CRITHMUM.

Cal. entire. *Petals* uniform, entire, broadest at the base, their extremities curved inwards. *Fruit* oval, striated.

1. Cr. *maritimum*, leaflets lanceolate fleshy. *p.* 89.—*Maritime rocks.*

11. HERACLEUM.

Involucres deciduous. *Flowers* radiant. *Petals* bifid. *Fruit* elliptical, dorsally compressed, striated.

1. H. *Sphondylium*, leaves pinnated, leaflets pinnatifid incised serrated. *p.* 89.—*Meadows.*

12. LIGUSTICUM.

Gen. involucre membranaceous. *Petals* uniform, incurved at the extremity, entire. *Cal.* of 5 teeth. *Fruit* oblong, furrowed.

1. L. *scoticum*, leaves biternate. *p.* 89.—*Rocky coasts.*
2. L. *Meum*, all the leaflets setaceo-multipartite. *p.* 89.—*Mountain pastures.*

13. ANGELICA.

Gen. involucre often wanting. *Petals* uniform, incurved, entire. *Fruit* roundish, with 3 wings on each side.

1. A. *sylvestris*, leaflets equal ovate serrated. *p.* 90.—*Moist woods.*

14. SIUM.

Involucres of many leaves. *Petals* heart-shaped, nearly uniform. *Fruit* nearly oval, laterally compressed and striated.

1. S. *latifolium*, stem erect, leaves pinnated, leaflets oblongo-lanceolate equally serrated, umbels terminal. *p.* 90.—*Sides of lakes, &c.*
2. S. *angustifolium*, stem erect, leaflets unequally lobed and serrated, umbels pedunculate opposite the leaves. *p.* 90.—*Ditches.*
3. S. *nodiflorum*, stem procumbent, leaves pinnate, leaflets ovate subequally serrated, umbels sessile opposite to the leaves. *p.* 90. —*Sides of rivulets.*
4. S. *repens*, stem creeping, leaflets broadly ovate inciso-dentate, umbels pedunculate opposite the leaves. *p.* 90.—*Sides of rivers.*

15. SISON.

Gen. and *partial involucre* of about 4 leaves (the former wanting in S. *inundatum*). *Petals* nearly uniform, inflexed. *Fruit* ovate, striated.

1. S. *verticillatum*, leaflets all capillary in whorled segments. *p.* 90.—*Moist pastures.*
2. S. *inundatum*, stem creeping, inferior leaves capillaceo-multipartite superior pinnatifid, umbels generally of 2 rays. *p.* 91. —*Inundated places.*
3. S. *segetum*, stem erect, leaves pinnate, leaflets broadly ovate serrated, radical ones lobed, umbels at first drooping, their rays unequal. *p.* 91.—*Fields.*

16. ŒNANTHE.

Flowers radiant, those of the disk sessile and abortive. *Fruit* crowned with the *cal.* and *styles*, corky.

1. Œ. *fistulosa*, root creeping stoloniferous, stem leaves pinnated, their main petiole as well as the stem cylindrical tubular, umbels of very few rays. *p.* 91.—*Ditches.*
2. Œ. *pimpinelloides*, leaflets of the radical leaves wedge-shaped cloven, those of the stem linear entire very long, gen. involucre of several linear leaves. *p.* 91.—*Salt marshes.*
3. Œ. *crocata*, all the leaflets wedge-shaped cut nearly equal, involucre of many leaves. *p.* 91.—*Ditch banks.*

B. *Umbels with a partial involucre; universal none.*

17. PHELLANDRIUM.

Flowers of the disk smallest. *Fruit* ovate, smooth, crowned with the *cal.* and *styles.*

1. Ph. *aquaticum*, segments of the leaves divaricated. *p.* 92.—*Ditches and pools.*

18. CICUTA.

Fruit subovate, furrowed.

1. C. *virosa*, umbels opposite to the leaves, sheaths of the leaves obtuse. *p.* 92.—*Sides of lakes.*

19. ÆTHUSA.

Partial involucre of 3 leaves, all on one side, pendulous.

1. Æ. *Cynapium*. *p.* 92.—*Fields and gardens.*

20. SCANDIX.

Fruit terminated with a very long rough beak. *Partial involucre* cut or pinnated.

1. S. *Pecten-Veneris*, leaflets cut into many linear segments, fruit and beak roughish. *p.* 92.—*Cornfields.*

21. ANTHRISCUS.

Fruit ovate, hispid, with a short glabrous beak. (*Pers.*)

1. A. *vulgaris*, bristles of the fruit hooked, stem smooth, umbels mostly lateral. *p.* 93.—*Waste places.*

22. CHÆROPHYLLUM.

Partial involucre of about 5, reflexed, concave leaves. *Fruit* linear-oblong, glabrous, smooth or striated.

* *Fruit smooth (not striated).*

1. Ch. ***sylvestre***, stem a little swelling below each joint glabrous, umbels on long stalks. *p.* 93.—*Hedges, &c.*
2. Ch. ***sativum***, umbels lateral sessile, fruit a little swelling below. *p.* 93.—*Hedges and about gardens.*

** *Fruit striated.*

3. Ch. ***temulentum***, stem rough (spotted) swelling below each joint. *p.* 93.—*Hedges.*
4. Ch. *odoratum*, seeds deeply sulcate (very large). *p.* 93.—*Orchards, &c.*
5. Ch. ***aureum***, pubescent, stems slightly swelling below the joints, leaflets very acuminate inciso-pinnatifid, seeds coloured furrowed. *p.* 94.—*Fields, rare.*
6. Ch. ***aromaticum***, leaflets ovato-oblong subacuminate serrate undivided. *p.* 94.—*Road-sides, rare.*

23. IMPERATORIA.

Fruit nearly elliptical, compressed, bordered, swelling in the middle with 3 ribs on each side.

1. I. *Ostruthium*. *p.* 94.—*Near old buildings, in waste places.*

C. *Umbels without involucres; rarely general, never partial ones.*

24. SMYRNIUM.

Petals acute, keeled, incurved. *Fruit* ovato-globose, gibbous. *Seeds* (*Akenia*) reniform, angular.

1. S. *Olusatrum*, cauline leaves ternate petiolate serrate. *p.* 94.—*Waste places near the coast.*

25. CARUM.

Gen. involucre of 1 or very few leaves. *Petals* inflexo-emarginate. *Fruit* ovato-oblong, striated.

1. C. *Carui*. *p.* 95.—*Pastures and rocks.*

26. PIMPINELLA.

Petals inflexed. *Stigmas* subglobose. *Fruit* ovato-oblong, striated.

1. P. *Saxifraga*, radical leaves pinnate, leaflets roundish sharply serrate, those of the stem bipinnate linear. *p.* 95.—*Dry pastures.*

27. APIUM.

Petals uniform. *Fruit* roundish, ribbed.

1. A. *graveolens*, stem leaves with their leaflets wedge-shaped, stem furrowed, umbels frequently sessile. *p.* 95.—*Salt marshes.*
2. A. *Petroselinum*, leaves of the stem with their leaflets linear, umbels all pedunculate. *p.* 95.—*Walls and maritime rocks.*

28. ÆGOPODIUM.

Petals unequal. *Stigmas* simple. *Fruit* ovato-oblong, ribbed.

1. Æ. *Podagraria.* *p.* 95.—*Waste places.*

ORDER XXXIX. SAXIFRAGEÆ. *Juss.*

Calyx superior or inferior, 4—5-cleft. *Cor.* perigynous, of 4—5 petals; sometimes wanting. *Stamens* 8—10, half opposite, half alternate with the petals. *Ovary* 1. *Styles* 2—5. *Disk* encircling the mouth of the calyx. *Capsule*, or *Berry*, many-seeded. *Embryo* in the axis of a fleshy albumen.

Herbs. *Flowers* usually alternate, sometimes opposite. *Mirb.*

1. SAXIFRAGA.

Cal. adherent or free, the limb 5-partite. *Cor.* of 5 petals. *Stam.* 10. *Caps.* with 2 beaks, 2-celled, many-seeded, opening between the beaks.

* *Leaves all radical undivided.*

1. S. *stellaris*, leaves oblongo-cuneiform angulato-serrate, scape branched, petals oblong acute, capsule superior. *p.* 128.—*Rivulets.*
2. S. *nivalis*, leaves obovate subpetiolate acutely crenate, scape (rarely branched) terminated by a dense cluster of flowers, capsule half inferior. *p.* 129.—*Mountains.*
3. S. *umbrosa*, leaves obovate petiolate subretuse with cartilaginous acutely crenate margins, scape panicled, capsule superior. *p.* 129.—*Woods.*

** *Stem leafy, leaves undivided.*

4. S. *oppositifolia*, leaves ovate opposite imbricated ciliated, flowers solitary terminal. *p.* 129.—*Rocky places.*
5. S. *aizoides*, lower leaves numerous crowded, the rest scattered linear-lanceolate sub-ciliate, stem ascending. *p.* 129.—*Springy places.*

*** *Stem leafy, leaves variously divided (especially the radical ones).*

6. S. *granulata*, radical leaves reniform on long footstalks obtusely lobed, those of the upper part of the stem nearly sessile acutely lobed, stem panicled, root granulated. *p.* 129.—*Banks.*

7. S. *cernua*, radical leaves reniform on long footstalks palmato-lobate, superior ones nearly sessile subtrifid, stem simple bulbiferous with one terminal flower. *p.* 130.—*Rocks.*

8. S. *rivularis*, leaves upon very long footstalks palmate, floral one obovate, stem weak of about 2 flowers. *p.* 130.—*Mountains.*

9. S. *tridactylites*, radical leaves spathulate entire and cuneiform trifid, upper cauline ones undivided, stem panicled, petals entire or longer than the cal. *p.* 130.—*Rocks and walls.*

10. S. *muscoides*, radical leaves aggregate linear obtuse entire and trifid, stem nearly naked few flowered, petals oblong obtuse (buff coloured) a little longer than the cal. *p.* 130.—*Highlands.*

11. S. *hypnoides*, radical leaves 3—5-cleft those of the long sterile shoots (mostly) linear-lanceolate acute all nearly glabrous, flowering stem panicled.

β. petals larger with the superior leaves (only) on the procumbent shoots undivided. *p.* 131.—*Highland mountains.*

12. S. *cæspitosa*, radical leaves 3- or mostly 5-cleft those of the sterile shoots mostly 3-, rarely and only below 5-cleft, all more or less hairy, flowering stem subpubescent panicled.

β. shoots long, leaves dark green ciliated only at the base.

γ. shoots rather short, leaves ciliated only, especially near the base, 1—3 flowers upon the stem.

δ. shoots very short, leaves dense ciliated only at the base, flowering stem short 1—2-flowered. *p.* 131.—*Rocks.* β. *Scotch Alps.* γ. *Rivulets.* δ. *Mountains.*

13. S. *pedatifida*, lower leaves and those of the rather short sterile shoots upon very long footstalks, divided into 3 deep linear lanceolate acute spreading segments, the lateral ones bifid, the superior leaves of the much branched flowering stem linear undivided. *p.* 132.—*Rocks.*

2. CHRYSOSPLENIUM.

Cal. adherent with the ovary, somewhat coloured, 4—5-cleft. *Cor.* 0. *Stam.* 8—10. *Styles* 2. *Caps.* with 2 beaks, 1-celled, many-seeded.

1. C. *alternifolium*, leaves alternate, lower ones subreniform upon very long footstalks. *p.* 128.—*Rocks and springs.*

2. C. *oppositifolium*, leaves opposite cordato-rotundate. *p.* 128. —*Shady places.*

3. ADOXA.

Cal. adherent with the ovary, 3-cleft. *Cor.* 4—5-cleft. *Stam.* 8—10. *Styles* 4—5. *Berry* globose, 4—5-celled.

1. A. *moschatellina. p.* 123.—*Woods and shady places.*

ORDER XL. GROSSULARIÆ. *Decand.*

(*Part of Cacti, Juss.*)

Cal. superior, 5-cleft. *Corolla* 5-petaled. *Stamens* 5, opposite the petals. *Ovary* 1. *Style* 1. *Stigma* double. *Berry* 1-celled, many-seeded. *Placenta* parietal. *Seeds* with a minute centrifugal *embryo* in the base of a corneous *albumen.*

Shrubs with opposite leaves. *Flowers* bracteated, in bunches. *Mirb.*

1. RIBES.

Cal. urceolate, 5-cleft. *Petals* 5. *Stamens* 5. *Style* 2-fid.

* *Without thorns.*

1. R. *rubrum*, without thorns erect, racemes glabrous pendulous, flowers nearly plane, petals obtuse. *p.* 81.—*Brushwood.*
2. R. *petræum*, without thorns erect, racemes when in flower erect in fruit pendulous slightly downy, flowers nearly plane, petals bluntish, bracteas shorter than the pedicel. *p.* 81.—*Woods.*
3. R. *alpinum*, without thorns erect, racemes erect both in flower and fruit, flowers plane shorter than the bracteas, leaves shining beneath. *p.* 81.—*Woods.*
4. R. *nigrum*, without thorns erect, racemes lax pubescent pendulous with a simple flowerstalk at their base, flowers campanulate, bracteas shorter than the pedicels, leaves punctato-glandulose beneath. *p.* 82.—*Woods.*

** *Thorny.*

5. R. *Grossularia*, branches prickly, leaves rounded and lobed, peduncles hairy, pedicels single-flowered with a pair of minute bracteas, fruit hairy. *p.* 82.—*Hedges and woods.*

ORDER XLI. HALORAGEÆ. *Br.*

(*Hygrobiæ, Rich. Cercodeæ, Juss.*)

Cal. superior, entire, or divided; or none. *Cor.* none. *Stamens* definite, inserted in the calyx. *Ovary* one- or few-celled. *Ovule* solitary, pendulous, or peltate. *Pericarp* indehiscent. *Embryo* in the axis of a fleshy albumen. *Radicle* superior.

Inconspicuous *Herbs* with opposite, usually whorled *leaves.* *Flowers* axillary.

1. HIPPURIS.

Cal. entire. *Stamen* 1. *Style* 1. *Pericarp* one-celled.

1. H. *vulgaris*, leaves whorled linear. *p.* 2.—*Ditches.*

2. MYRIOPHYLLUM.

Monœcious. *Cal.* 4-leaved. *Stam.* 8. *Stigmas* 4, sessile. *Pericarp* 4-celled.

1. M. *spicatum*, sterile flowers in interrupted leafless spiked whorls. *p.* 272.—*Ditches.*

3. CALLITRICHE [a].

Monœcious. *Flowers* naked. *Stamen* 1. *Styles* 2. *Pericarp* 4-celled.

1. C. *aquatica.* *p.* 259.—*Ditches.*

ORDER XLII. ONAGRARIÆ. *Juss.*

Cal. superior, 2—4-cleft. *Cor.* of 2—4 petals. *Stamens* definite; when equal in number to the petals alternate with them. *Style* 1. *Stigma* 2—4-cleft. *Capsule* 2—4-celled, 1—many-seeded. *Seeds* with or without albumen. *Embryo* straight. *Herbs* with alternate or opposite leaves. *Mirb.*

1. CIRCÆA.

Cal. 2-leaved. *Cor.* of 2 petals. *Stam.* 2. *Caps.* 2-celled. *Cells* with one seed.

1. C. *Lutetiana*, stem erect pubescent, leaves ovato-cordate denticulate. *p.* 4.—*Woods and coppices.*
2. C. *alpina*, stem ascending glabrous, leaves cordate toothed shining. *p.* 4.—*Woods and coppices.*

2. EPILOBIUM.

Cal. 4-partite, deciduous. *Pet.* 4. *Stam.* 8. *Caps.* elongate, obtusely 4-sided, 4-celled, 4-valved, many-seeded. *Seeds* comose.

* *Flowers irregular.* *Stam. bent down.*

1. E. *angustifolium*, leaves scattered linear lanceolate veined glabrous, flowers irregular subspicate, stam. declined. *p.* 116. —*Rocks.*

** *Flowers regular.* *Stam. erect.* *Petals doubly notched.*

2. E. *hirsutum*, leaves semiamplexicaul ovato-lanceolate dentato-serrate hairy, stem very much branched hairy, root creeping, stigma 4-cleft. *p.* 117.—*Ditches, rivers, and lakes.*
3. E. *parviflorum*, leaves sessile lanceolate slightly toothed downy

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[a] Mr. Brown has long ago suggested the propriety of referring this genus to HALORAGEÆ, notwithstanding the differences of its structure. The ovula are peltate, not pendulous; but the radicle is superior, and in the axis of a fleshy albumen like *Hippuris* and *Myriophyllum*; the mode of insertion of ovula is not in this instance, therefore, of its usual importance.

on both sides, stem nearly simple very downy, root fibrous, stigma 4-cleft. *p.* 117.—*Marshes and banks of rivers.*

4. E. *palustre*, leaves narrow lanceolate sessile nearly entire and as well as the rounded erect stem subglabrous, stigma undivided. *p.* 117.—*Bogs and lakes.*
5. E. *tetragonum*, leaves lanceolate sessile glabrous denticulate, stem with 4 angles nearly glabrous, stigma undivided. *p.* 117. —*Ditches.*
6. E. *montanum*, leaves ovato-acute shortly petiolate glabrous all toothed, stem round pubescent as well as the fruit, stigma 4-cleft. *p.* 117.—*Stony places.*
7. E. *alsinifolium*, leaves ovato-acuminate rather obtuse sessile glabrous lowermost ones entire the rest very slightly toothed, stem round glabrous as well as the fruit, stigma entire. *p.* 117. —*Highland mountains.*
8. E. *alpinum*, leaves elliptical glabrous on short footstalks nearly entire, stem nearly glabrous, and fruit entirely so, stigma undivided. *p.* 118.—*Wet places.*

ORDER XLIII. CUCURBITACEÆ. *Juss.*

Flowers unisexual. *Cal.* superior, 5-cleft. *Cor.* regular, 5-lobed, bearing the stamens. *Stamens* definite, united in 3 sets. *Anthers* linear, sinuous, either all syngenesious or only 4, the 5th being separate on a distinct filament. *Ovary* 1. *Placentas* 3—5-lobed, radiating from the sides of the ovary, and forming spurious dissepiments. *Style* 3-fid. *Stigmas* 3, 2-lobed. *Fruit* a berry (*Pepo*), spuriously 1—3—5—10-celled, its outside dry, inside pulpy. *Embryo* straight, surrounded by attenuated albumen. *Cotyledons* large, fleshy.

Stems climbing or decumbent, bearing *cirrhi*. *Leaves* rough, alternate, simple. *Mirb.*

1. BRYONIA.

Monœcious. Barren Fl. Cal. 5-toothed. *Cor.* 5-cleft. *Filam.* 3. *Anthers* 5. *Fertile Fl. Cal.* 5-toothed. *Cor.* 5-cleft. *Style* trifid. *Berry* few-seeded.

1. Br. *dioica*, leaves palmate rough on both sides, flowers diœcious. *p.* 272.—*Garden hedges.*

ORDER XLIV. SALICARIÆ. *Juss.*

(*Lythariæ, Mirb.*)

Cal. inferior, 6—12-cleft. *Cor.* of 6 petals or none. *Stam.* 6—12. *Ovary* 1. *Capsule* 2-valved, 2-celled, many-seeded.

Valves bearing the septa in their middle. *Embryo* straight, surrounded by a small portion of albumen.

Herbs with opposite or alternate leaves. *Flowers* axillary, often in a whorled spike. *Mirb.*

1. LYTHRUM.

Cal. cylindrical, with 12 teeth, alternately smaller. *Stam.* 12, in two rows. *Capsule* oblong.

1. L. *Salicaria,* leaves opposite cordato-lanceolate, flowers spiked with 12 stam. *p.* 147.—*Marshy places.*

2. PEPLIS.

Cal. campanulate, the teeth alternately reflexed. *Stam.* 6, short.

1. P. *Portula,* flowers axillary solitary, leaves obovate. *p.* 111. —*Marshes.*

ORDER XLV. ILLECEBREÆ. *Br.*

(*Paronychiæ Aug. Juss.*)

Cal. of one leaf, 5-parted or nearly so. *Pet.* 5 inserted into the cal., often resembling scales or barren filaments, sometimes wanting. *Stam.* definite, rarely more or less than 5, distinct. *Anthers* round. *Style* 1 and *Stigma* simple or divided; or *styles* and *Stigmas* several. *Fruit* capsular, sometimes 1-seeded, closed or opening at the top, sometimes 1-celled, many-celled, with many valves at the top. *Seeds* in the monospermous genera often suspended by a chord originating in the base of the capsule; in those with many seeds placed on a central, little elevated *placenta*. *Embryo* mostly curved and subcylindrical, placed on the outside of a farinaceous albumen, with a radicle ascending and pointing towards the hilum; in a few scarcely curved, with an inferior radicle.

Herbs or *Undershrubs*, with opposite branches. *Leaves* sometimes opposite with stipules and stalks; sometimes connate and sessile without stipules. *Flowers* terminal or axillary, naked or with scarious bracteæ. *Juss.*

1. SCLERANTHUS.

Cal. tubular, contracted at the neck, above 5-cleft. *Pet.* 0. *Stam.* mostly 10 placed in the top of the calyx. *Styles* and *Stigmas* 2. *Capsule* 1-seeded.

1. S. *annuus*, "cal. of the fruit spreading acute, stems patent." *p.* 133.—*Cornfields.*
2. S. *perennis*, "cal. of the fruit closed obtuse, stems procumbent." *p.* 133.—*Sandy places.*

ORDER XLVI. ROSACEÆ. *Juss.*

Cal. superior or inferior, divided. *Cor.* polypetalous, sometimes wanting. *Stamens* indefinite, rarely definite, inserted into a disk encircling the mouth of the calyx. *Anthers* small, roundish. *Ovary* 1, many-celled, many-styled; or 1-celled, 1-styled; or *Ovaries* numerous, 1-celled, 1-styled. *Styles* lateral. *Fruit* an apple in those with an inferior ovary; in the rest an aggregation of *Achenia* or *follicles*, inclosed within the calyx tube, which is sometimes fleshy; attached to a more or less exserted *receptacle*. *Seeds* ascending or suspended. *Embryo* straight, without albumen. *Radicle* laterally opposite the hilum. *Cotyledons* broad.

Trees or *Herbs* with alternate leaves and stipules.

SECT. I. POMACEÆ. *Fruit inferior, seed ascending.*

1. PYRUS.

Cal. 5-cleft. *Apple* with from 2—5 two-seeded cells. *Testa* cartilaginous.

1. P. *Malus*, leaves ovate acute serrated, flowers in a sessile umbel. *p.* 151.—*Woods and hedges.*
2. P. *aucuparia*, leaves pinnated glabrous on both sides, flowers corymbose. *p.* 151.—*Woods.*
3. P. *Aria*, leaves ovate cut and serrated white and downy beneath, flowers corymbose. *p.* 152.—*Woods.*

2. CRATÆGUS.

Cal. persistent. *Fruit* closed, with from 2—5 2-seeded *nuts*. *Testa* membranous.

1. C. *Oxyacantha*, spiny, leaves glabrous cleft into three or five deep serrated segments the lower ones spreading, flowers corymbose, styles 1—2. *p.* 151.—*Woods and hedges.*

SECT. II. ROSACEÆ. *Achenia superior, inclosed in a fleshy urceolate tube of the calyx, and enveloped in the hairs of the receptacle. Seeds suspended. Stamens indefinite.*

1. ROSA.

* PIMPINELLIFOLIÆ. *Setigerous, with arms crowded, nearly uniform, or unarmed; mostly without bracteas. Leaflets ovate or oblong. Segments of the cal. connivent, persistent. Disk scarcely any.*

1. R. *rubella*, arms crowded equal, fruit elongate pendulous. *p.* 152.—*Banks of rivers.*
2. R. *spinosissima*, arms unequal, leaflets plane without pubescence simply serrated. *p.* 154.—*Pastures.*
3. R. *involuta*, arms very unequal and crowded, leaflets doubly serrated, petals convolute, fruit bristly. *p.* 154.—*Mountains.*
4. R. *Sabini*, bristles few and prickles unequal distant, leaflets doubly serrated tomentose, segments of the calyx compound.

β. *Doniana*, bristles scarcely any, prickles nearly straight. *p.* 155. —*Scotland.* β. *Mountains.*

** Villosæ. *Root-shoots straight, prickles nearly so. Leaflets ovate or oblong, with their serratures spreading. Leaflets of the calyx connivent, persistent; disk of the calyx thickened, closing over the mouth.*

5. R. *villosa*, leaflets elliptical obtuse, fruit very large with numerous rigid crowded bristles, segments of the calyx viscid hispid. *p* 155.—*Woods.*

6. R. *tomentosa*, leaflets ovate rather acute, fruit hispid or naked.

α. vera, shoots bent, segments of the calyx compound.

β. mollis, shoots straight, segments of the calyx subsimple. *p*. 156.—*α. Sea-side. β. Banks of rivers.*

*** Rubiginosæ. *Prickles unequal, sometimes setiform, rarely (if ever) none. Leaflets ovate or oblong, glandular, with the serratures divergent. Segments of the calyx persistent. Disk incrassated. Shoots bent.*

7. R. *rubiginosa*, prickles hooked, leaflets rugose opaque, calyces and peduncles hispid.

α. vulgaris, prickles strong very unequal, styles hairy, fruit ovate or oblong.

ϑ. *inodora*, prickles very much hooked nearly equal, leaflets less glandular, segments of the calyx deciduous before maturity. *p*. 157.—*α. Hedges. ϑ. Edinburgh.*

**** Caninæ. *Prickles equal, hooked. Leaflets ovate, without glands; serratures connivent. Segments of the calyx deciduous. Disk incrassated, closing over the mouth of the tube. The larger shoots bent.*

8. R. *canina*, leaflets rigid ovate, ovaries 20—30.

ε. *dumetorum*, leaves hairy on both sides, segments of the cal. and peduncles smooth.

ζ. *cæsia*, leaflets cæsious hairy on both sides, tube of the calyx elliptical. *p*. 157.—*Hedges. ζ. Banks of rivers.*

***** Systylæ. *Styles cohering in a lengthened column. Stipules adnate. Habit much like that of the last division.*

9. R. *arvensis*, shoots flagelliform, prickles unequal falcate, leaflets glaucous beneath. *p*. 158.—*Hedges.*

10. R. *systyla*, shoots assurgent, prickles very stout hooked. *p*. 159.—*Hills.*

Sect. III. Potentilleæ. *Achenia superior, attached to an usually fleshy exserted receptacle. Seeds suspended. Stamens indefinite.*

1. GEUM.

Cal. 10-cleft; alternate segments minute. *Petals* 5. *Pericarps* with a long geniculated *awn*. *Receptacle* oblong.

1. G. *urbanum*, flowers erect, awns naked, cauline leaves ternate, radical ones lyrate pinnate. *p*. 165.—*Woods and hedges.*

2. G. *rivale*, flowers drooping, awns feathery, cauline leaves ternate, radical ones interruptedly pinnato-lyrate. *p*. 165.—*Marshes.*

2. AGRIMONIA.

Cal. 5-cleft, with a lobed appendage at its base. *Pet.* 5. *Stam.* 12. *Pericarps* 2 in the bottom of the calyx.

1. A. *Eupatoria*, cauline leaves interruptedly pinnate, terminal leaflet on a footstalk, fruit hispid. *p.* 147.—*Road-sides.*

3. RUBUS.

Cal. 5-cleft. *Fruit* composed of many juicy connate *drupes* on a dry *receptacle.*

1. R. *idæus*, leaves pinnate with 3 or 5 leaflets white and very downy beneath, footstalks channelled, stem nearly erect prickly. *p.* 159.—*Woods.*
2. R. *suberectus*, leaves pinnate with 5 or 7 ovate leaflets hairy beneath, upper ones ternate, stems nearly erect, prickles minute nearly straight. *p.* 159.—*Woods.*
3. R. *cæsius*, leaves ternate very pubescent or hairy beneath, the lateral ones much lobed externally, stem prickly rounded prostrate glaucous, cal. embracing the fruit. *p.* 160.—*Hedges and waste places.*
4. R. *corylifolius*, " leaves of about 5 ovate leaflets, hairy beneath, stems rounded diffuse with scattered nearly straight prickles." *p.* 160.—*Hedges.*
5. R. *fruticosus*, " leaves of about 5 petiolated leaflets hoary with pubescence beneath, prickly upon the angles of the stem, prickles hooked." *p.* 160.—*Woods.*
6. R. *saxatilis*, leaflets 3 slightly downy, runners creeping herbaceous, panicle of few flowers. *p.* 161.—*Mountainous places.*
7. R. *arcticus*, leaflets 3 glabrous obtusely serrated, stem without prickles bearing (mostly) 1 flower, petals roundish notched. *p.* 161.—*Mountainous places.*
8. R. *Chamæmorus*, diœcious, leaves simple lobed, stem without prickles and having a single flower. *p.* 161.—*Mountains.*

4. FRAGARIA.

Cal. 10-cleft; segments alternately smaller. *Pet.* 5. *Pericarps* inserted upon a large, pulpy, deciduous *receptacle.*

1. F. *vesca*, root with creeping scions, hairs of the pedicels appressed sericeous. *p.* 162.—*Woods.*
2. F. *elatior*, " cal. of the fruit reflexed, hairs of the petioles and peduncles all very patent and subdeflexed." *p.* 162.—*Road-sides.*

5. POTENTILLA.

Cal. 10-cleft; segments alternately smaller. *Petals* 5. *Pericarps* roundish, fixed to a small dry *receptacle.*

* *Leaves pinnate.*

1. P. *anserina*, leaves interruptedly pinnate deeply serrate silky beneath, stem creeping, peduncles axillary single-flowered. *p.* 162.—*Meadows.*

** *Leaves digitate.*

2. P. *argentea*, leaves quinate, leaflets cuneiform cut white and downy beneath, their margins revolute, stem decumbent. *p.* 162.—*Barren stony soils.*
3. P. *verna*, radical leaves quinate, leaflets obovate green on both sides sharply serrated hairy beneath and at the edges, petals obcordate longer than the cal., stem decumbent. *p.* 162.—*Rocky pastures.*
4. P. *opaca*, radical leaves of 7 or 5 oblongo-cuneiform deeply serrated hairy leaflets, petals obcordate a little longer than the cal., stem filiform decumbent. *p.* 163.—*Scotland.*
5. P. *aurea*, radical leaves quinate those of the stem ternate, leaflets wedge-shaped their margins with silky hairs deeply serrated at the extremity, petals obcordate larger than the cal., stem decumbent. *p.* 163.—*Mountains.*
6. P. *reptans*, leaves quinate, leaflets obovato-cuneiform serrated, peduncles axillary single-flowered longer than the leaf, stem filiform creeping. *p.* 163.—*Meadows and pastures.*

*** *Leaves ternate.*

7. P. *tridentata*, leaves ternate, leaflets oblongo-cuneiform three-toothed at the extremity glabrous above hairy beneath, petals ovate longer than the cal., stem ascending. *p.* 163.—*Rocks.*
8. P. *Fragaria*, leaves ternate, leaflets obovate deeply serrated silky on both sides (especially beneath), petals obcordate as long as the cal., stems procumbent. *p.* 164.—*Woods, banks, and pastures.*

6. TORMENTILLA.

Cal. 8-cleft; segments alternately smaller. *Petals* 4. *Pericarps* roundish, fixed to a small dry *receptacle.*

1. T. *officinalis*, leaves ternate all sessile, leaflets lanceolate inciso-serrate, stem nearly erect dichotomous. *p.* 164.—*Barren places.*
2. T. *reptans*, leaves ternate on footstalks, leaflets obovato-cuneiform inciso-dentate, stem prostrate. *p.* 164.—*Waste places.*

7. COMARUM.

Cal. 10-cleft; segments alternately smaller. *Petals* 5 less than the calyx. *Pericarps* inserted upon a large spongy villous permanent receptacle.

1. C. *palustre.* *p.* 165.—*Peat bogs and marshes.*

SECT. IV. SANGUISORBEÆ. *Achenia superior, inclosed in the calyx. Seed suspended. Stamens usually definite.*

1. ALCHEMILLA.

Cal. 8-cleft; segments alternately smaller. *Stam.* 1—5. *Pericarp* 1.

1. A. *vulgaris*, leaves uniform plaited many-lobed serrated.

α. *major*, leaves almost smooth.

β. *minor*, much smaller, leaves very pubescent. *p.* 56.—*Pastures.*

2. A. *alpina*, leaves digitate serrated at the extremity white and satiny beneath. *p.* 56.—*Mountains.*
3. A. *arvensis*, leaves trifid pubescent, lobes deeply cut, flowers sessile axillary. *p.* 56.—*Gravelly soils.*

2. DRYAS.

Cal. 8—10-cleft; segments equal. *Petals* 5—8. *Pericarps* with long feathery awns.

1. Dr. *octopetala*, petals 8, leaves simple serrated. *p.* 165.—*Mountains.*

3. POTERIUM.

Monœcious. Barren fl. Cal. of 4 leaves. *Cor.* 4-partite. *Stam.* 30—40. *Fertile fl. Cal.* of 4 leaves. *Cor.* 4-partite. *Pericarps* 2.

1. P. *Sanguisorba*, thorns none, stem somewhat angular, stamens much longer than the cal. *p.* 273.—*Pastures.*

4. SANGUISORBA.

Cal. 4-lobed, coloured, bracteate at the base. *Pericarps* 2, surrounded by the persistent base only of the *cal.*

1. S. *officinalis*, glabrous, spikes ovate, stamens about as long as the perianth. *p.* 54.—*Moist meadows.*

SECT. V. AMYGDALEÆ. *Drupe superior, solitary, naked. Seed suspended. Stamens indefinite.*

1. PRUNUS.

Nut of the *drupe* nearly smooth.

1. Pr. *Padus*, flowers in pendulous racemes, leaves obovate deciduous glabrous with two glands at the summit of the footstalk. *p.* 150.—*Woods.*
2. Pr. *Cerasus*, flowers in nearly sessile umbels, leaves ovato-lanceolate subpubescent beneath. *p.* 150.—*Woods and hedges.*
3. Pr. *domestica*, peduncles solitary or two together, leaves ovato-lanceolate subpubescent beneath, branches without spines. *p.* 150.—*Woods and hedges.*
4. Pr. *insititia*, peduncles in pairs, leaves ovato-lanceolate pubescent beneath, branches ending in a spine. *p.* 150.—*Hedges.*
5. Pr. *spinosa*, peduncles (mostly) solitary, leaves elliptico-lanceolate, subpubescent beneath, branches very spinose. *p.* 151.—*Hedges.*

SECT. VI. SPIRÆÆ. *Follicles superior, few-seeded. Stamens indefinite.*

1. SPIRÆA.

Cal. 5-cleft. *Pericarps* 3—12.

* *Shrubby.*

1. S. *salicifolia*, leaves ovato-lanceolate serrated glabrous, racemes terminal compound. *p.* 152.—*Woods.*

** *Herbaceous.*

2. S. *Filipendula*, leaves interruptedly pinnate, all the leaflets uniform deeply cut or serrated paniculato-cymose. *p.* 152.—*Pastures.*
3. S. *Ulmaria*, leaves interruptedly pinnate serrated downy beneath, terminal leaflet largest and lobed, flowers in compound (and as it were proliferous) cymes. *p.* 152.—*Meadows.*

ORDER XLVII. LEGUMINOSÆ. *Juss.*

Cal. inferior, 5-cleft or 5-toothed. *Cor.* of 5 petals, papilionaceous. *Stam.* 10, monadelphous, diadelphous or distinct. *Ovary* one, 1-celled. *Style* and *Stigma* 1. *Legumen* 2-valved, dehiscent, or indehiscent. *Placenta* marginal. *Seeds* with or without *albumen*, furnished with a *micropyle*. *Radicle* recurved on the cotyledons, which are large and thick.

Herbs or *Shrubs*. *Leaves* alternate, compound, furnished with general and partial stipules; jointed.

* *Stam. all connected or monadelphous, the tube often cleft above.*

1. GENISTA.

Cal. 2-lipped, upper one with 2, lower one with 3 teeth. *Standard* bent backwards from the rest of the flower. (*Genista* and *Spartium*, *Sm.*)

* *Branches unarmed.*

1. G. *scoparia*, leaves ternate and solitary oblong, flowers axillary shortly pedicellate, legumes hairy at the margin, branches angular. *p.* 211.
2. G. *tinctoria*, leaves lanceolate glabrous, branches rounded striated erect, flowers racemose, legumes glabrous. *p.* 212.

** *Branches spinose.*

3. G. *anglica*, leaves ovato-lanceolate glabrous, spines simple none on the flowering branches, flowers axillary subracemose, legumes glabrous. *p.* 212.

2. ULEX.

Cal. of 2 leaves, with a small scale at the base on each side. *Legume* turgid, scarcely longer than the *cal.*

1. U. *europæus*, cal. teeth obsolete connivent, bracteas ovate lax, branchlets erect. *p.* 212.
2. U. *nanus*, "teeth of the cal. lanceolate spreading, bracteas minute close-pressed, branches reclining," *Sm.* *p.* 212.

3. ONONIS.

Cal. 5-cleft, its divisions linear. *Standard* striated. *Legume* turgid, sessile. *Filaments* in one undivided set.

1. O. *arvensis,* stem hairy, branches at length spinous, flowers mostly solitary, leaves ternate below, the rest simple serrated entire at their base. *p.* 213.

4. ANTHYLLIS.

Cal. inflated, 5-toothed; inclosing the small, roundish, 1—3-seeded *legume.*

1. A. *vulneraria,* leaves pinnated unequal, heads of flowers in pairs. *p.* 213.

** *Stam. diadelphous, nine united and one free.*

† *Style more or less pubescent beneath the stigma.*

5. OROBUS.

Style linear, cylindrical, downy above. *Cal.* obtuse at the base, its upper segments deeper and shorter.

1. O. *tuberosus,* leaves pinnated with 3—4 pairs of lanceolate leaflets glaucous beneath, stipules semisagittate toothed at the base, stem simple erect. *p.* 213.
2. O. *niger,* leaves pinnated with 4—6 pairs of ovate or elliptical leaflets, stem branched angular erect[a].—*Rocks by the side of the Isla, den of Airly.*
3. O. *sylvaticus,* leaves pinnate hairy with 7—10 pairs of ovato-oblong acute leaflets, stipules semisagittate, stem branched decumbent hairy. *p.* 213.

6. LATHYRUS.

Style plane, downy above, broader upwards. *Cal.* with its 2 upper segments shortest.

1. L. *pratensis,* peduncles 2—8-flowered, tendrils with two lanceolate 3-nerved leaflets, stipules sagittate as large as the leaves. *p.* 213.
2. L. *sylvestris,* peduncle 4—5-flowered, tendrils with 2 ensiform leaflets, stem winged. *p.* 214.
3. L. *latifolius,* peduncles many-flowered, tendrils with 2 ovato-elliptical mucronated leaflets, stem winged. *p.* 214.
4. L. *palustris,* peduncles from 3—6-flowered, tendrils with 2—4 pairs of linear-lanceolate acute leaflets, stipules semisagittate lanceolate, stem winged. *p.* 214.

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[a] This has lately been communicated to me by Mr. Drummond of Forfar, who has had the good fortune to discover it, truly wild, at Airly, 10 miles west of Forfar.

7. VICIA.

Style bearded beneath the *stigma.*

* *Peduncles lengthened, many-flowered.*

1. V. *sylvatica*, peduncles many-flowered longer than the leaves, leaflets elliptico-oblong mucronate, stipules lunate deeply toothed at their base. *p.* 214.
2. V. *Cracca*, peduncles many-flowered longer than the leaves, flowers imbricated, leaflets lanceolate slightly hairy, stipules semisagittate nearly entire. *p.* 215.

** *Flowers axillary, nearly sessile.*

3. V. *sativa*, flowers sessile subbinate, legumes nearly erect, lower leaves retuse, stipule toothed impressed with a dark spot, seeds smooth. *p.* 215.
4. V. *lathyroides*, flowers sessile solitary, legumes glabrous, leaves generally in 3 pairs lower ones retuse, stipules entire, seeds tuberculated. *p.* 215.
5. V. *lutea*, flowers sessile solitary, legumes reflexed hairy, stem diffuse, stipules coloured, standard glabrous. *p.* 215.
6. V. *sepium*, flowers mostly in fours subpetiolate, legumes upright glabrous, leaflets ovate obtuse gradually smaller upwards upon the petiole. *p.* 215.

8. ERVUM.

Stigma capitate, hairy all over on the outside.

1. E. *hirsutum*, peduncles many-flowered, legumes hairy 2-seeded, leaflets linear oblong truncate. *p.* 216.
2. E. *tetraspermum*, peduncles 2-flowered, legumes glabrous 4-seeded, leaflets linear-oblong obtuse. *p.* 216.

† *Style glabrous.*

+ *Legume more or less jointed.*

9. ORNITHOPUS.

Legume jointed, curved, cylindrical.

1. O. *perpusillus*, leaves pinnated with 6—9 pairs of leaflets and a terminal one, flowers capitate bracteated, legumes curved upwards. *p.* 216.

10. HIPPOCREPIS.

Legume compressed, submembranaceous, with many deep notches in one of its edges.

1. H. *comosa*, legumes 5—8 clustered pedunculated curved scabrous sinuated at each margin. *p.* 216.

++ *Legume of 2 longitudinal cells, more or less complete.*

11. ASTRAGALUS.

Legume 2-celled, more or less gibbous.

* *Keel of the cor. terminating in a straight point; upper suture of the legume with its margins introflexed.* (*Oxytropis, Decand.*)

1. A. *uralensis*, silky, stem none, scape longer than the leaves, legumes erect ovato-cylindraceous inflated pubescent 2-celled, style persistent. *p.* 216.
2. A. *campestris*, somewhat silky, stemless, scape about the same length as the leaves, legumes erect ovate inflated pubescent semibilocular. *p.* 217.

** *Keel of the cor. obtuse. Legume with the lower suture having its margins introflexed.* (*Astragalus, Decand.*)

3. A. *hypoglottis*, stem prostrate, leaflets slightly emarginate, legumes erect capitate hairy their cells 1-seeded. *p.* 217.
4. A. *glycyphyllos*, stem prostrate, legumes somewhat triangular curved sessile glabrous, leaves longer than the peduncles, leaflets oval. *p.* 217.

+ + + *Legume of 1 cell, one- or many-seeded, not jointed.*

* *Flowers racemose* (*Melilotus, Decand.*).

12. TRIFOLIUM.

Legume (in general) shorter than the *cal.*, 1- or many-seeded, indehiscent, deciduous.

* *Flowers racemose.*

1. Tr. *officinale*, legumes racemed naked 2-seeded rugged, stipules lanceolato-subulate undivided, leaflets obovato-oblong toothed, stem erect. *p.* 217.

** *Flowers more or less capitate.*

† *Legumes naked, many-seeded.*

2. Tr. *ornithopodioides*, legumes naked subternate with about 8 seeds twice as long as the cal., leaflets obcordate toothed at the extremity, stems decumbent. *p.* 218.

†† *Legumes covered by the cal., many-seeded.*

3. Tr. *repens*, heads umbellate, legumes with 4 seeds, cal. teeth unequal, leaflets obcordate serrulate, stem creeping. *p.* 218.

††† *Legumes covered by the cal., 1-seeded.*

+ *Cal.* (*hairy*) *not inflated after flowering. Standard of the cor. deciduous.*

4. Tr. *pratense*, "heads dense ovate, lower tooth of the cal. shorter than the tube of the monopetalous unequal cor., leaflets oval nearly entire, stem ascending," *Willd.*
5. Tr. *medium*, "heads lax somewhat globose solitary, lower tooth of the cor. as long as the tube of the monopetalous nearly equal cor., leaflets elliptical minutely serrated and striated with veins, stem branched zigzag," *Willd.*

6. Tr. *arvense*, heads very hairy subcylindrical, cal. teeth setaceous longer than the cor., leaflets narrow-obovate. *p.* 219.
7. Tr. *scabrum*, heads terminal and axillary sessile ovate, cal. teeth unequal narrow lanceolate rigid at length recurved, leaflets obcordate serrulate. *p.* 219.
8. Tr. *striatum*, heads terminal and axillary ovate subsolitary subsessile, cal. striated hairy with unequal straight teeth, leaflets obcordate nearly entire pubescent. *p.* 219.

++ *Cal. remarkably inflated after flowering. Standard of the cor. deciduous.*

9. Tr. *fragiferum*, heads upon long stalks roundish, cal. after flowering inflated membranaceous pubescent 2 of the teeth setaceous reflexed, stems creeping, leaflets obcordate serrated. *p.* 219.

+++ *Standard of the cor. persistent, scariose, enveloping the fruit. (Flowers yellow.)*

10. Tr. *procumbens*, " spikes oval imbricated, standard deflexed persistent sulcated, stems procumbent, leaflets obovate," *Sm.*
11. Tr. *minus*, "spikes capitate hemisphærical, peduncles straight, standards smoothish, stems procumbent, petiole lengthened upwards," *Sm. p.* 220.
12. Tr. *filiforme*, " heads lax of few flowers, peduncles capillary flexuose, standards smooth, stems procumbent, leaflets subsessile," *Sm.*

13. LOTUS.

Legume cylindrical, straight. *Wings* of the *cor.* cohering by their upper edge. *Filaments* dilated upwards.

1. L. *corniculatus*, heads depressed, stems decumbent, legumes cylindrical patent. *p.* 220.

14. MEDICAGO.

Legume falcate or spirally twisted, compressed, membranaceous.

1. M. *sativa*, peduncles racemed, legumes smooth spirally twisted, stipules entire, leaflets long toothed. *p.* 220.
2. M. *lupulina*, spikes oval, legumes reniform 1-seeded, stipules entire, leaflets obovate. *p.* 220.

ORDER XLVIII. RHAMNEÆ. *Juss.*

Cal. more or less inferior, 4—5-parted, with a valvular *æstivation*. *Petals* 4—5. *Stamens* 4—5, opposite to and often hooded by the cucullate *petals*. *Ovarium* 2—3-celled. *Ovulum* solitary, erect. *Fruit* baccate, capsular, or drupaceous. *Embryo* in the axis of a fleshy albumen.

Shrubs or *Trees*. *Leaves* simple, alternate, stipulate.

1. RHAMNUS.

Cal. urceolate, 4—5-cleft. *Berry* 2—4-celled, 2—4-seeded.

1. Rh. *catharticus*, spines terminal, flowers 4-cleft diœcious, leaves ovate sharply serrated. *p.* 80.—*Dumfries.*
2. Rh. *Frangula*, unarmed, flowers perfect, leaves obovate smooth entire. *p.* 81.—*Woods.*

ORDER XLIX. CELASTRINÆ. *Br.*

Cal. inferior, 4—5-parted, with an imbricate *æstivation*. *Petals* 4—5. *Stamens* as many, alternate with the *petals*, and having a doubtfully perigynous insertion. *Ovarium* 2—4-celled, 1—many-seeded; *ovules* erect, rarely pendulous. *Style* 1—4. *Pericarp* capsular or closed (baccate, drupaceous, or winged). *Seeds* with an *arillus* in the capsular genera. *Embryo* in the axis of a fleshy albumen.

Shrubs or *Trees*. *Leaves* simple (rarely compound), alternate, or opposite. *Stipules* generally minute, sometimes absent. *Br.*

1. EUONYMUS.

Cal. plane, 4—5-cleft. *Caps.* with 5 angles, 5-celled, 5-valved. *Seeds* covered by a coloured *arillus*.

1. E. *europæus*, flowers mostly tetrandrous, peduncles compressed, many-flowered, leaves ovato-lanceolate on short footstalks, branches smooth. *p.* 81.—*Hedges.*

2. ILEX.

Cal. 4—5-toothed. *Cor.* rotate, 4—5-cleft. *Stigmas* 4, sessile. *Drupe* sphærical. *Nuts* 4, 1-seeded. (Some flowers without *pistil.*)

1. I. *aquifolia*, leaves ovate acute spinous. *p.* 57.—*Woods.*

SECT. III. *Petals hypogynous.*

ORDER L. HYPERICINÆ. *Juss.*

Cal. 4—5-parted. *Pet.* 4—5. *Stam.* indefinite, polyadelphous. *Anthers* roundish. *Ovary* simple. *Styles* and *Stigmas* several. *Capsule* dry or baccate, 1- or many-celled, many-valved. *Cells* formed by the introflexed margins of the valves. *Seeds* very numerous, minute, attached to parietal or axile placentas. *Embryo* straight, without albumen. *Cotyledons* very short.

Herbs or *Shrubs*. *Leaves* opposite. *Flowers* in opposite corymbs, often terminal. *Juss.*

1. HYPERICUM.

Cal. 5-partite. *Pet.* 5. *Filaments* united at the base into 3—5 bundles. *Styles* 2—3—5. *Stigmas* as many. *Cells* of the fruit 2—3—5.

* *Styles* 5.

1. H. *calycinum*, styles 5, flowers solitary, segments of the cal. unequal obovate obtuse, leaves oblong, stem shrubby branched square. *p.* 221.—*Woods.*

+ *Styles* 3.

† *Cal. segments entire at the margins.*

2. H. *Androsæmum*, styles 3, capsule pulpy, stem shrubby compressed, cal. leaflets unequal, leaves ovate sessile. *p.* 221.—*Woods.*
3. H. *quadrangulum*, styles 3, stem herbaceous 4-angular somewhat branched, leaves ovate with pellucid dots, cal. leaves lanceolate. *p.* 221.—*Pastures.*
4. H. *perforatum*, styles 3, stem compressed, leaves elliptico-oblong obtuse with pellucid dots, cal. leaves lanceolate. *p.* 221. —*Woods.*
5. H. *dubium*, stem obsoletely quadrangular, leaves elliptical ovate obtuse destitute of pellucid dots, cal. leaves elliptical. *p.* 221.—*Woods.*
6. H. *humifusum*, styles 3, flowers terminal subcymose, stems compressed prostrate, leaves oblong obtuse glabrous. *p.* 222. —*Gravelly pastures.*

†† *Margins of the segments of the cal. fringed with glandular serratures.*

7. H. *montanum*, styles 3, flowers paniculato-corymbose, cal. with glandular serratures, stem erect rounded smooth, leaves ovate glabrous. *p.* 222.—*Mountainous woods.*
8. H. *barbatum*, styles 3, corymbs terminal, cal. fringed with long pedunculated glands, stem erect rounded, leaves ovate with (black) scattered dots beneath. *p.* 222.—*Woods.*
9. H. *hirsutum*, styles 3, cal. with (black) glandular serratures, stem erect rounded pubescent, leaves ovate slightly downy beneath. *p.* 222.—*Woods and thickets.*
10. H. *pulchrum*, styles 3, cal. with (black) glandular serratures, stem erect, leaves cordate glabrous amplexicaul. *p.* 222. —*Woods and heaths.*
11. H. *elodes*, styles 3, cal. with (reddish) glandular serratures glabrous, leaves roundish pubescent, stem rounded creeping. *p.* 223.—*Bogs.*

ORDER LI. ACERACEÆ. *Juss.*

Cal. monophyllous. *Pet.* definite, rarely none, inserted round an hypogynous disk. *Stam.* definite, generally different in number from the petals, inserted into the middle of the same disk. *Ovary* simple, placed on the disk. *Style* and *Stigma* one; rarely double. *Fruit* of many cells or many capsules; the cells or capsules 3 or 2, each containing one or at the most 3 suspended seeds. *Embryo* without albumen, its *radicle* bent back upon the *cotyledons*.

Trees or *Shrubs*. *Leaves* opposite, without stipules. *Flowers* in racemes or corymbs. *Juss.*

1. ACER.

Cal. 5-cleft. *Pet.* 5. *Stam.* 8. *Ovary* 2-lobed. *Samaræ* 2, united at the base, 1-celled, 1—2-seeded.

1. A. *pseudo-Platanus*, leaves 5-lobed unequally serrated, racemes pendulous subtomentose. *p.* 120.—*Plantations.*
2. A. *campestre*, lobes of the leaves mostly 5 inciso-crenate, racemes upright subtomentose. *p.* 120.—*Woods.*

ORDER LII. TILIACEÆ. *Juss.*

Cal. 5-parted. *Pet.* 5. *Stamens* indefinite. *Ovary* 1, with 5 cells. *Ovules* definite, peltate. *Style* 1. *Stigma* obscurely 5-lobed. *Pericarp* by abortion with 1 cell and 1 seed. *Seeds* peltate. *Embryo* transverse in the axis of a farinaceous albumen. *Cotyledons* foliaceous, lobed. *Radicle* inferior.

Trees. *Leaves* alternate, with stipules. *Flowers* in corymbs. *Mirb.*

1. TILIA.

Cal. deciduous. *Pet.* 5. *Pericarp* coriaceous, 5-celled, without valves. *Cells* 2-seeded.

1. T. *europæa*, flowers destitute of nectary, leaves cordate acuminate serrated, pericarp ribbed woody. *p.* 170.—*Walks and avenues.*

ORDER LIII. MALVACEÆ. *Juss.*

Cal. 5-cleft, calyculate. *Cor.* of 5 petals, regular. *Stam.* indefinite, monadelphous, often bearing the petals on their base. *Anthers* reniform. *Ovary* 1. *Style* 1. *Stigmas* several. *Fruit* composed either of many cells and many valves which bear the septa in their middle, or of many capsules which are either dehiscent or indehiscent; united into a compact body or placed in a whorl round the base of the style. *Seeds* solitary, ascending. *Albumen* mucilaginous, not abundant. *Embryo* curved. *Cotyledons* foliaceous, plaited.

Herbs or *Shrubs* or *Trees*. *Leaves* alternate, with stipules. *Flowers* axillary. *Mirb. Juss.*

1. LAVATERA.

Cal. double, exterior 3-cleft. *Styles* many. *Capsules* numerous, circularly arranged, 1-seeded.

1. L. *arborea*, stem arborescent, leaves with about 7 angles downy plaited, peduncles axillary clustered single-flowered. *p.* 209.—*Rocks.*

2. MALVA.

Cal. double, exterior of 3 leaves. *Styles* many. *Capsules* numerous, circularly arranged, 1-seeded.

1. M. *sylvestris*, stem erect herbaceous, leaves with 7 rather acute lobes, peduncles and petioles hairy. *p.* 208.—*Waste places.*
2. M. *rotundifolia*, stem prostrate, leaves roundish cordate 5-lobed, fruitstalks bent down. *p.* 208.—*Waste places.*
3. M. *moschata*, stem erect, radical leaves reniform in 5 or 7 broad incised lobes, cauline one 5-partite pinnato-multifid, segments linear, cal. hairy, leaflets of the ext. cal. linear. *p.* 209.—*Meadows and pastures.*

3. ALTHÆA.

Cal. double, exterior of 9 leaves. *Styles* several. *Capsules* numerous, circularly arranged, 1-seeded.

1. A. *officinalis*, leaves oblongo-ovate slightly 3—5-lobed serrated. *p.* 208.—*Marshes.*

ORDER LIV. GERANIACEÆ. *Juss.*

Cal. inferior, 5-leaved. *Cor.* 5-petaled, regular or irregular. *Stamens* 10, sometimes monadelphous. *Ovary* 1. *Style* 1. *Stigmas* 5. *Capsule* 3-celled, 3-valved, valves separating with elasticity from their axis and remaining attached by their indurated persistent style. *Seeds* one in each cell, erect, without albumen. *Embryo* doubled.

Herbs with alternate stipulated leaves. *Mirb.*

1. ERODIUM.

Monogynous. *Cal.* of 5 leaves. *Cor.* of 5 petals. Nectariferous *glands* 5. Imperfect *filaments* 5, alternating with the 5 perfect *stamens*. *Fruit* beaked, separating into 5 1-seeded capsules, each with a long spiral awn bearded in the inside.

1. E. *cicutarium*, peduncles many-flowered, leaves pinnate, leaflets sessile pinnatifid and cut, petals longer than the cal., stem prostrate hairy. *p.* 205.—*Waste grounds.*

2. GERANIUM.

Monogynous. *Cal.* of 5 leaves. *Cor.* of 5 regular petals. Nectariferous *glands* 5. *Stamens* 10. *Fruit* beaked, separating into 5 monospermous capsules, each tipped with a long, naked, simple awn (neither spiral nor bearded).

* *Peduncles 1-flowered.*

1. G. *sanguineum*, peduncles 1-flowered, leaves nearly orbicular in 5—7 deep lobes each of which is trifid. *p.* 206.—*Rocks.*

** *Peduncles 2-flowered. Roots perennial.*

2. G. *Phæum*, peduncles 2-flowered opposite the leaves, cal. slightly awned, petals waved, capsules keeled hairy below wrinkled above, stem erect. *p.* 206.—*Woods.*
3. G. *sylvaticum*, peduncles 2-flowered, leaves subpeltate with 5 or 7 deep and acute lobes which are cut and serrated, stem erect corymbose, petals slightly notched, capsules keeled hairy (not wrinkled). *p.* 206.—*Thickets.*
4. G. *pratense*, peduncles 2-flowered, leaves 5-partite, lobes multipartite all the segments acute, capsules hairy smooth (not wrinkled). *p.* 206.—*Pastures.*
5. G. *pyrenaicum*, peduncles 2-flowered, leaves reniform 5—7-lobed, lobes oblong obtuse trifid and toothed at the extremity, stem erect branched, petals deeply notched twice as long as the cal. *p.* 206.—*Waste places.*

*** *Peduncles 2-flowered. Root annual.*

6. G. *lucidum*, peduncles 2-flowered, leaves roundish 5-lobed, lobes trifid and notched obtuse, calyces pyramidal angular dentato-tuberculate, capsules wrinkled. *p.* 207.—*Rocks and walls.*
7. G. *robertianum*, peduncles 2-flowered, leaves ternate or quinate, leaflets pinnatifid, segments mucronate, cal. angular hairy, capsules wrinkled. *p.* 207.—*Woods.*
8. G. *molle*, peduncles 2-flowered, leaves rounded or reniform lobed and cut downy, petals notched scarcely longer than the cal., capsules transversely wrinkled, seeds smooth. *p.* 207.—*Waste places.*
9. G. *rotundifolium*, peduncles 2-flowered, leaves rounded or reniform lobed and cut downy, petals entire the length of the cal., capsules smooth (not wrinkled) hairy, seeds punctate. *p.* 207.—*Waste places.*
10. G. *pusillum*, peduncles 2-flowered, flowers pentandrous, petals notched, leaves rounded or reniform in 5—7 deep lobes, lobes trifid, capsules smooth carinated downy with erect appressed hairs, seeds smooth. *p.* 207.—*Waste grounds.*
11. G. *dissectum*, peduncles 2-flowered, petals notched rather longer than the much awned cal., leaves 5-partite, lobes trifid

or laciniated linear, capsules smooth hairy, seeds punctate. *p.* 208.—*Hedges.*

12. G. *columbinum*, peduncles 2-flowered shorter than the leaves which are 5-partite, the lobes divided into many acute segments, petals entire as long as the much awned cal., capsules smooth glabrous, seeds punctate. *p.* 208.—*Pastures.*

ORDER LV. OXALIDEÆ. *Br.*

Cal. inferior, 5-leaved; imbricated in æstivation. *Petals* 5, regular, unguiculate. *Stamens* 10, monadelphous, alternately shorter. *Capsule* rostrate, 5-celled, 10-valved, 2—many-seeded. *Valves* cohering by the axis. *Seeds* suspended, thrown out of the capsule by the elastic rupture of the outer coat of the testa. *Embryo* in the axis of a fleshy albumen. *Cotyledons* flat.

Herbs with many parted, rarely simple leaves.

1. OXALIS.

Cal. 5-partite. *Cor.* of 5 petals. *Caps.* angular, 5-celled. *Cells* 2- or many-seeded. *Seeds* with an elastic arillus.

1. O. *Acetosella*, leaves all radical ternate inversely heart-shaped hairy, scape single-flowered, root squamose. *p.* 141.—*Woods and hedge-banks.*

2. O. *corniculata*, stem branched spreading, flowers single or subumbellate shorter than the petioles, leaves ternate obcordate pubescent. *p.* 141.—*Old walls.*

ORDER LVI. BALSAMINEÆ. *Juss.*

Cal. deciduous, 3-leaved, with one leaf larger than the rest, and elongated into a spur. *Petals* very unequal, the two lowest the largest. *Stamens* 5. *Anthers* cohering. *Ovary* 5-celled, many-seeded. *Stigma* sessile, simple. *Capsule* 5-celled, 5-valved, many-seeded. *Valves* bearing the dissepiments in their middle, and separating with elasticity when ripe. *Seeds* suspended. *Embryo* of the same form as the seed. *Cotyledons* thick, ovate, convex. *Radicle* very small, superior. *Albumen* none.

Herbs with opposite or alternate leaves. *Flowers* axillary.

1. IMPATIENS.

1. I. ***Noli-me-tangere*, joints of the stem swelling, leaves ovate serrated petiolate, peduncles solitary many-flowered. *p.* 76.—*Moist groves.***

ORDER LVII. LINEÆ. *Decand. Théorie.*

Part of Caryophylleæ. Juss.

Cal. 5-cleft. *Pet.* 5. *Stamens* definite, often monadelphous. *Ovary* 1. *Styles* many, each with one stigma. *Stigmas* oblique. *Capsule* many-celled, many-valved. *Seeds* definite, pendulous. *Embryo* in the axis of an oleaginous albumen, straight. *Cotyledons* foliaceous. *Radicle* superior.

Herbs. Leaves opposite. *Flowers* usually terminal.

1. LINUM.

Cal. persistent. *Petals* 5. *Stamens* 5. *Styles* 5. *Caps.* globose, mucronate, 10-celled. *Seeds* ovate, compressed.

1. L. *usitatissimum*, leaves lanceolate alternate, cal. leaves acute 3-nerved, petals crenate, stem subsolitary. *p.* 97.—*Corn-fields.*

2. L. *catharticum*, leaves opposite oblong, stem dichotomous above, petals acute. *p.* 97.—*Dry pastures.*

2. RADIOLA.

Cal. many-cleft. *Pet.* 4. *Stam.* 4. *Styles* 2. *Capsule* 8-valved, 8-celled. *Seeds* solitary.

1. R. *millegrana. p.* 60.—*Moist gravelly soils.*

ORDER LVIII. CARYOPHYLLEÆ. *Juss.*

Cal. many-cleft. *Pet.* definite. *Stam.* definite, fewer than or equal in number to the petals, these alternate with them, or twice as many, those opposite them being inserted into the base of the petals. *Ovary* 1. *Styles* 2—5, each with one oblique stigma. *Capsule* 1-celled, many-valved, many-seeded. *Placenta* in the axis, or parietal. *Embryo* curved or spiral. *Albumen* farinaceous.

Herbs. Leaves opposite, connate or verticillate, rarely with stipules. *Flowers* often terminal, sometimes axillary.

DIV. I. CARYOPHYLLEÆ. *Cal. monophyllous, tubular, with 4—5 teeth.*

1. SAPONARIA.

Cal. monophyllous, tubular, 5-toothed, destitute of scales at the base. *Pet.* 5, clawed. *Stam.* 10. *Styles* 2. *Caps.* oblong, 1-celled.

1. S. *officinalis*, leaves ovato-lanceolate, calyces cylindrical glabrous. *p.* 134.—*Road-sides.*

2. DIANTHUS.

Cal. monophyllous, tubular, 5-toothed, with about 4 imbricated opposite scales at the base. *Pet.* 5, clawed. *Stam.* 10. *Styles* 2. *Caps.* cylindrical, 1-celled.

* *Flowers clustered.*

1. D. *Armeria*, flowers clustered fascicled, calyx-scales lanceolate downy as long as the tube. *p.* 134.—*Fields.*

** *Flowers solitary, many on the same stem.*

2. D. *deltoides*, flowers solitary, cal. scales mostly 2 lanceolate acute, petals notched. *p.* 134.—*Rocks.*

3. SILENE.

Cal. monophyllous, tubular, often ventricose, 5-toothed. *Pet.* 5, clawed, mostly crowned at the mouth, and the limb generally notched or bifid. *Stam.* 10. *Styles* 3. *Caps.* 3-celled, 6-toothed, many-seeded.

* *Cal. glabrous.*

1. S. *inflata*, flowers panicled, cal. inflated glabrous reticulated with veins, leaves ovate. *p.* 134.—*Pastures and sea-coast.*

2. S. *acaulis*, cæspitose, leaves linear ciliated at the base, peduncles solitary single-flowered, petals slightly notched crowned. *p.* 135.—*Alps.*

** *Cal. pubescent.*

3. S. *nutans*, flowers panicled secund cernuous, petals deeply bifid their segments linear, leaves (of the stem) lanceolate pubescent. *p.* 135.—*Rocks, rare.*

4. S. *noctiflora*, cal. with 10 angles veined, teeth nearly as long as the tube, stem dichotomous. *p.* 135.—*Corn-fields.*

4. LYCHNIS.

Cal. monophyllous, tubular, 5-toothed. *Pet.* 5, clawed, crowned at the orifice, their limb divided. *Stam.* 10. *Styles* 5. *Caps.* opening with 5 or more teeth, 1- or 5-celled.

1. L. *Flos Cuculi*, flowers loosely panicled, petals 4-cleft, caps. roundish 1-celled. *p.* 141.—*Meadows.*

2. L. *Viscaria*, petals slightly notched at the extremity, caps. 5-celled, stem clammy at the joints. *p.* 142.—*Rocks, rare.*

3. L. *alpina*, glabrous, petals bifid, flowers corymboso-capitate, capsule 1-celled. *p.* 142.—*Alps, rare.*

4. L. *dioica*, flowers diœcious, caps. 1-celled. *p.* 142.—*Hedges.*

DIV. II. ALSINEÆ. *Cal. 4—5-leaved, or 5-partite to the very base.*

5. AGROSTEMMA.

Cal. monophyllous, tubular, coriaceous, 5-cleft. *Pet.* 5, clawed, their limb undivided. *Caps.* opening with 5 teeth, 1-celled.

1. A. *Githago*, hairy, cal. much longer than the cor., petals entire destitute of a crown. *p.* 141.—*Corn-fields.*

6. SAGINA.

Cal. of 4 leaves. *Petals* 4 (shorter than the *cal.*). *Stam.* 4. *Styles* 4. *Caps.* of 1 cell, 4-valved.

1. S. *procumbens*, perennial glabrous, stems procumbent, leaves shortly mucronate, petals much shorter than the cal., caps. longer than the cal. *p.* 59.—*Gravelly soils.*
2. S. *apetala*, annual subpubescent, stems erect or procumbent only at the base, leaves aristate, petals much smaller than the cal., caps. longer than the cal. *p.* 60.—*Dry gravelly soils.*
3. S. *maritima*, annual glabrous, stems erect or procumbent only at the base, leaves fleshy obtuse, petals none, cal. rather longer than the caps. *p.* 60.—*Sea-coast.*

7. MŒNCHIA.

Cal. of 4 leaves. *Pet.* 4 (as long as the *cal.*). *Caps.* of 1 cell, opening with several teeth at the extremity.

M. *glauca. p.* 60.—*Gravelly pastures.*

8. SPERGULA.

Cal. 5-leaved. *Pet.* 5, undivided. *Stam.* 5—10. *Styles* 5. *Caps.* ovate, 5-celled, 5-valved.

1. S. *arvensis*, leaves whorled with minute membranaceous stipules at the base, stalk of the fruit reflexed, seeds more or less margined. *p.* 144.—*Corn-fields.*
2. S. *nodosa*, leaves subulate opposite glabrous connate, the lower ones sheathing, the upper ones bearing clusters of young leaves, petals much longer than the cal. *p.* 145.—*Wet sandy places.*
3. S. *subulata*, leaves subulate subciliated tipped with a bristly point, peduncles solitary very long, petals and capsule as long as the cal. *p.* 145.—*Dry pastures.*
4. S. *saginoides*, glabrous, leaves subulate acute awnless, peduncles solitary very long, flowers drooping, petals as long as the cal., caps. twice as long. *p.* 145.—*Mountains.*

9. CERASTIUM.

Cal. 5-leaved. *Pet.* 5, cloven. *Stam.* 10. *Styles* 5. *Caps.* bursting at the top with 10 teeth (5 in *Cer. aquat.*).

* *Petals not exceeding the cal. in length.*

1. C. *vulgatum*, hairy viscid suberect, leaves ovate, flowers capitate longer than their pedicels. *p.* 142.—*Road-sides, &c.*
2. C. *viscosum*, hairy viscid spreading, leaves oblongo-lanceolate, flowers somewhat panicled shorter than their pedicels. *p.* 142.—*Pastures, &c.*

3. C. ***semidecandrum***, hairy viscid suberect, leaves oblongo-ovate, flowers somewhat panicled shorter than their pedicels, stam. 5, petals but slightly notched. *p.* 143.—*Hills and walls.*
4. C. *tetrandrum*, "hairy subviscid, flowers quadrifid tetrandrous, petals bifid shorter than the cal." *p.* 143.—*Walls and sea-shores.*

** *Petals longer than the cal.*

5. C. *arvense*, leaves linear-lanceolate more or less pubescent especially at the base, petals twice as long as the cal. *p.* 143.—*Gravelly pastures.*
6. C. *alpinum*, subglabrous or clothed with long white soft silky hairs, leaves elliptical ovate, flowers 1—3, capsule oblong curved. *p.* 144.—*Alps.*
7. C. *latifolium*, clothed with short rigid yellowish pubescence, leaves elliptical ovate, flowers 1—2, capsules ovate. *p.* 144. *Alps.*
8. C. *aquaticum*, upper leaves cordato-ovate sessile, flowers solitary, fruit pendulous. *p.* 144.—*Watery places.*

10. CHERLERIA.

Cal. of 5 leaves. *Pet.* 5, extremely minute, notched. *Stam.* 10. *Styles* 3. *Caps.* 1-celled, opening with 3 *valves*, many-seeded, *Sm.* (3-celled, *cells* 2-seeded, *Decand.*).

1. Ch. *sedoides*. *p.* 139.—*Alps.*

11. ARENARIA.

Cal. of 5 leaves. ***Pet.*** 5, undivided. ***Stam.*** 10. ***Styles*** 3. ***Caps.*** 1-celled, many-seeded.

* *Exstipulate. Leaves ovate.*

1. **A. *peploides*, leaves ovate acute fleshy. *p.* 137.—*Sea-coast.***
2. **A. *trinervis*, leaves ovate acute petiolate 3- (rarely 5-) nerved ciliated, flowers solitary, calyces rough on the keel with 3 obscure ribs. *p.* 137.—*Woods.***
3. **A. *serpyllifolia*, leaves ovate acute subscabrous sessile, cal. hairy its outer leaves 5-ribbed. *p.* 138.—*Waste places.***

** *Exstipulate. Leaves subulate.*

4. **A. *verna*, stems (numerous) panicled above, leaves subulate rather obtuse striated, petals obovate longer than the 3-nerved cal. *p.* 138.—*Mountain pastures.***
5. A. ***tenuifolia***, stem more or less branched, branches panicled at their extremities, leaves subulate acute, petals lanceolate much shorter than the lanceolate very acuminated 3-nerved cal. *p.* 138.—***Walls and rocks, rare.***
6. A. ***fastigiata***, stem erect straight, leaves fascicled subulato-setaceous erect, flowers fascicled, cal. much acuminated

(white) with 2 central (green) nerves twice as long as the ovate petals. *p.* 138.—*Mountain rocks, rare.*

*** *Stipules at the base of each pair of leaves.*

7. A. *rubra*, stems prostrate, leaves narrow linear acute plane somewhat fleshy tipped with a very minute bristle, stipules ovate cloven, capsule as long as the cal., seeds compressed angular roughish. *p.* 138.—*Gravelly soils.*
8. A. *marina*, stems prostrate, leaves semicylindrical fleshy awnless, stipules ovate cloven, caps. longer than the cal., seeds compressed smooth with a broad membranous pellucid border. *p.* 139.—*Sea-coast.*

12. STELLARIA.

Cal. of 5 leaves. *Pet.* 5, deeply cloven. *Stam.* 10. *Styles* 3. *Caps.* 1-celled, opening with 6 teeth, many-seeded.

1. S. *Nemorum*, leaves petiolate cordate, upper ones ovate sessile, panicle dichotomous. *p.* 135.—*Woods.*
2. S. *media*, leaves ovate, stems procumbent with an alternate line of hairs on one side, petals bipartite, stam. 5—10.—*Waste places.*
3. S. *holostea*, stem nearly erect, leaves lanceolate much acuminated finely serrulate, petals inversely heart-shaped bifid twice as long as the nerveless cal. *p.* 136.—*Woods.*
4. S. *graminea*, stem nearly erect, leaves lanceolate acute entire, panicle much branched, petals very deeply cleft, segments linear scarcely longer than the 3-nerved leaves of the cal. *p.* 136. —*Dry pastures.*
5. S. *glauca*, stems nearly erect, leaves linear-lanceolate entire glaucous, flowers upon long solitary axillary footstalks, petals very deeply cleft, their segments linear much longer than the 3-nerved cal. *p.* 136.—*Marshes.*
6. S. *uliginosa*, stem decumbent ovato-lanceolate entire with a callous tip, flowers in dichotomous panicles, petals bipartite shorter than the cal. *p.* 136.—*Ditches.*
7. S. *cerastoides*, stems decumbent with an alternate hairy line, leaves oblongo-spathulate, peduncles 2—3 mostly terminal and as well as the cal. which is twice as long as the bifid cor. glanduloso-pilose. *p.* 136.—*Alps.*
8. S. *scapigera*, stem shorter than the flowerstalks, leaves linear-lanceolate crowded pubescenti-scabrous at the margin, cal. 3-nerved as long as the petals. *p.* 137.—*Mountains, rare.*

ORDER LIX. SEMPERVIVÆ. *Juss.*

(*Crassulaceæ, Juss.*)

Cal. inferior, of one piece, many-cleft. *Cor.* sometimes monopetalous. *Stamens* either equal in number to the petals and alternate with them, or twice as many, half alternate and half opposite. *Ovaries* equal in number to the *petals. Disk* hypogynous. *Follicles* many-seeded. *Seeds* small. *Embryo* in the axis of a fleshy more or less abundant *albumen. Radicle* opposite the *hilum.*

Herbs with fleshy opposite or alternate *leaves. Flowers* alternate, or in *spikes, corymbs,* or *cymes. Mirb.*

1. COTYLEDON.

Cal. 5-cleft. *Cor.* monopetalous, tubular, 5-fid. *Caps.* 5, with a nectariferous *scale* at their base.

1. C. *Umbilicus,* leaves peltate crenate depressed in the centre, stem spiked with the numerous racemes of pendulous flowers, upper bracteas minute entire. *p.* 139.—*Rocks and old buildings.*

2. SEMPERVIVUM.

Cal. 12-cleft. *Petals* 12. *Capsules* 12.

1. S. *Tectorum,* leaves ciliated, offsets spreading. *p.* 149.—*House-tops and walls.*

3. SEDUM.

Cal. 4—7-cleft. *Pet.* 5. *Caps.* 5, with a nectariferous *scale* at their base.

* *Leaves plane.*

1. S. *Telephium,* leaves flattish serrated, corymbs leafy, stem erect. *p.* 139.—*Borders of fields, hedges and waste places.*

** *Leaves rounded, fixed by their base.*

2. S. *dasyphyllum,* leaves opposite (alternate on the flowering stem) cordato-ovate obtuse fleshy, stem weak, panicle glutinous. *p.* 140.—*Rocks and walls.*
3. S. *album,* leaves scattered oblong cylindrical obtuse spreading, cyme much branched. *p.* 140.—*Rocks and walls.*
4. S. *villosum,* leaves scattered oblong plane above and as well as the peduncles and stems hairy and viscid. *p.* 140.—*Bogs and moist rocks.*

*** *Leaves rounded, produced below the point of insertion into a kind of spur, which is pressed to the stem.*

5. S. *anglicum,* leaves ovate gibbous fleshy produced at the base alternate, cyme bifid. *p.* 140.—*Walls and rocks.*
6. S. *acre,* leaves ovate gibbous fleshy produced at the base al-

ternate, cyme trifid leafy. *p.* 140.—*Rocks, walls, and stony places.*

7. S. *reflexum*, leaves scattered subulate fleshy produced at the base, flowers subcymose. *p.* 141.—*Walls, roofs of houses and thatched buildings.*

4. RHODIOLA.

Diœcious. *Barren fl. Cal.* 4-partite. *Pet.* 4. *Nectaries* 4, emarginate. *Fertile fl. Cal.* 4-partite. *Pet.* 4. *Nectaries* 4, emarginate. *Caps.* 4, many-seeded.

1. Rh. *rosea. p.* 289.—*Wet rocks.*

ORDER LX. PORTULACEÆ. *Juss.*

Cal. 2—5-cleft. *Cor.* of 5 *petals* or 5-cleft. *Stam.* definite or indefinite. *Ovary* 1. *Style* 1-, often many-cleft. *Stigmas* 2—5. *Pyxis* 1-celled, many-seeded. *Seeds* attached to a central placenta, albuminous. *Embryo* annular.

Herbs or *Under-shrubs. Leaves* alternate or opposite, often fleshy. *Mirb.*

1. MONTIA.

Cal. of 2 *leaves. Cor.* of 1 *petal. Stam.* 3. *Styles* 3. *Caps.* 3-valved, 3-seeded.

1. M. *fontana. p.* 47.—*Rills, springy and wet places.*

ORDER LXI. DROSERACEÆ. *Decand.*

(*Part of Capparides, Juss.*)

Cal. 5-cleft, persistent. *Pet.* 5, equal, unguiculate. *Stam.* definite. *Anthers* turned outwards, adnate, in æstivation rolled up with the *styles. Pollen* cohering in masses of from 3—5 *granules. Ovary* 1-celled, many-seeded. *Placentas* parietal, opposite to the angles of the *ovary. Stigmas* simple. *Caps.* 1-celled, half 3—5-valved, many-seeded. *Seeds* very small. *Embryo* round, minute, in the base of a fleshy *albumen. Radicle* opposite the *hilum.*

Herbs. Leaves radical. *Flowers* on scapes.

1. DROSERA.

Cal. 5-cleft. *Petals* 5. *Styles* 6. *Caps.* 1-celled, 3—5-valved, many-seeded.

1. D. *rotundifolia*, leaves radical orbicular spreading upon rather a short footstalk, scape with a simple raceme. *p.* 98.—*Bogs.*

2. D. *longifolia*, leaves radical obovate tapering below into a long footstalk erect, scape with a simple raceme. *p.* 98.—*Bogs.*
3. D. *anglica*, leaves radical oblongo-spathulate tapering down into a long footstalk erect, scape with a simple raceme. *p.* 98. —*Bogs.*

ORDER LXII. CISTEÆ. *Juss.*

Cal. 5-parted. *Petals* 5. *Stamens* indefinite. *Ovary* 1. *Style* and *Stigma* 1. *Capsule* many-seeded, many-valved; sometimes 1-celled, with the *placentas* in their middle; sometimes many-celled, with *dissepiments* proceeding from the middle of the *valves*. *Seeds* numerous, round. *Embryo* recurved or spiral, surrounded with a somewhat fleshy *albumen*. (*Radicle* at the opposite extremity of the *seed* to the *umbilicus*. *Br. MSS.*[*])

Shrubs or *Under-shrubs*. *Leaves* opposite, with or without *stipules*. *Flowers* in *racemes* or *corymbs*. *Mirb.*

1. CISTUS.

Cal. of 5 *leaves*, 2 smaller than the rest. *Pet.* 5. *Caps.* with 3 *valves* and many *seeds*.

1. C. *Helianthemum*, somewhat shrubby procumbent, leaves elliptical oblong somewhat hairy mostly white and pubescent beneath, the margin slightly revolute, stipules lanceolate. *p.* 170. —*Dry pastures.*

ORDER LXIII. VIOLACEÆ. *Vent.*

Cal. 5-cleft. *Pet.* 5, irregular. *Stam.* 5. *Anthers* often united. *Style* and *Stigma* 1. *Capsule* 1-celled, 3-valved, many-seeded. *Seeds* attached to the middle of the *valves*. *Embryo* in the axis of a fleshy *albumen*. *Radicle* opposite the *hilum*.

Herbs with alternate *leaves* and *stipules*.

1. VIOLA.

Cal. 5-cleft, the segments produced at the base. Upper *petal* spurred at the base.

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[*] We are obliged to Mr. Brown for the knowledge of this important peculiarity in the structure of the seeds of *Cistus*. The true direction of the radicle had been previously overlooked by carpological botanists, (unless Gærtner intended to indicate it by the term "radicula centripeta" which he applies to *Cistus* and *Helianthemum*,) and, as Mr. Brown has remarked to us, offers, by this curious anomaly, a character by which not only the limits of *Cisteæ* can be positively defined, but which indicates the affinity of *Lechea* and *Hudsonia* to this order, in both which he has observed the same structure.

* *Stigma acute, recurved (stipules entire).*

1. V. *hirta*, stemless, leaves cordate rough, as well as the petioles and capsules, with hairs, cal. obtuse. *p.* 76.—*Woods.*
2. V. *odorata*, stemless throwing out runners, leaves heart-shaped glabrous, as well as the petioles, cal. obtuse. *p.* 77.—*Hedges and banks.*
3. V. *palustris*, stemless, leaves reniform quite smooth veiny beneath, cal. obtuse, spur very short. *p.* 77.—*Bogs.*
4. V. *canina*, stem at length ascending channelled, leaves cordate acute, stipules long dentato-ciliate, cal. acute. *p.* 77.—*Woods and banks.*
5. V. *lactea*, stem ascending, leaves ovato-lanceolate smooth, stipules dentate, cal. acute. *p.* 77.—*Pastures.*

** *Stigma erect, large and perforated (stipules deeply divided).*

6. V. *tricolor*, stem angled branched spreading, leaves oblong deeply crenate, stipules lyrate pinnatifid. *p.* 77.—*Cornfields.*
7. V. *lutea*, stem simple erect, leaves ovato-oblong crenate, stipules deeply lobed palmate. *p.* 77.—*Pastures.*

ORDER LXIV. POLYGALEÆ. *Juss.*

Cal. 5-parted, equal or unequal, with two segments larger than the rest and coloured. *Pet.* definite, 4, 3, 2, fastened on one side into one, split on the other. *Stam.* often 8, rarely fewer, generally diadelphous, in two equal bundles, inserted either into distinct petals, or into the monopetalous tube. *Anthers* generally 1-celled, opening by a pore at the top. *Style* 1. *Stigma* thickish. *Capsule* or *drupa* generally 2-celled; the capsule with two valves and a dissepiment opposite to them. *Cells* 1-seeded. *Seeds* pendulous usually with an arillus at the hilum. *Embryo* straight in the axis of a fleshy *albumen.*

Shrubs or *Herbs. Leaves* without stipules. *Flowers* terminal with bracteæ; rarely axillary. *Juss.*

1. POLYGALA.

Cal. of 5 leaves, two of them wing-shaped and coloured. *Caps.* compressed, obcordate.

1. P. *vulgaris*, flowers in a terminal raceme crested, wings of the cal. nerved obtuse longer than the cor., stem herbaceous procumbent, leaves linear-lanceolate. *p.* 211.—*Pastures.*

ORDER LXV. CRUCIFERÆ. *Juss.*

Cal. of 4 leaves. *Pet.* 4. *Stam.* 6, tetradynamous, alternate with the petals; 2 solitary, 4 in 2 pairs. *Ovary* and *Style* 1. *Disk* in the form of hypogynous glands. *Pericarp* (a *Silicule* or *Siliqua*) 2-celled, 2-valved, many-seeded. *Placenta* like a dissepiment, parallel with the valves. *Seeds* without albumen, in two rows in each cell. *Embryo* recurved. *Radicle* opposite the hilum.

Herbs. *Leaves* alternate. *Flowers* in corymbs, spikes, or panicles. *Mirb.*

DIV. I. SILICULOSÆ.

1. CAKILE.

Pouch of 2 single-seeded articulations; upper articulation with an erect sessile seed; the lower one with a pendulous seed (sometimes abortive).

1. C. *maritima*, articulations of the pouch two-edged the upper one sagittate, leaves pinnatifid subdentate fleshy. *p.* 193.

2. CRAMBE.

Pouch with the upper articulation subglobose; its seed inverted, fixed to the base of the cell by its (long, curved) seedstalk; the lower articulation abortive, resembling a pedicel.

1. Cr. *maritima*, the four longer filaments forked, pouch pointless, leaves roundish sinuated waved toothed glaucous and as well as the stem glabrous. *p.* 193.

3. CORONOPUS.

Pouch 2-lobed, without valves, wingless; cells 1-seeded. *Cotyledons* incumbent, linear.

1. C. *Ruellii*, pouch undivided crested with little sharp points. *p.* 193.

4. THLASPI.

Pouch compressed, emarginate; the valves keel-shaped (often winged) many-seeded. *Filaments* without teeth distinct. *Cal.* unequal in its insertion, patent.

1. Th. *arvense*, pouch orbicular, its wings dilated longitudinal, seeds concentrically striated, leaves oblong sagittate toothed glabrous. *p.* 194.
2. Th. *Bursa-Pastoris*, pouch obcordate without wings, radical leaves pinnatifid. *p.* 194.

5. TEESDALIA.

Pouch emarginate, the valves keel-shaped; cells 2-seeded. *Filaments* with a little scale on their inside.

1. T. *nudicaulis*. *p.* 194.

6. LEPIDIUM.

Pouch with 1-seeded cells, their valves keel-shaped. *Pet.* equal.

1. L. *latifolium*, leaves lanceolate undivided serrated or entire, pouch oval entire. *p.* 194.
2. L. *ruderale*, flowers diandrous apetalous, radical leaves pinnatifid those of the branches linear entire, pouch emarginate patent. *p.* 194.
3. L. *campestre*, pouch ovate emarginate winged rough with minute scales, style scarcely longer than the notch, cauline leaves sagittate toothed. *p.* 195.
4. L. *hirtum*, pouch ovate emarginate winged glabrous, style nearly half as long as the pouch, cauline leaves sagittate toothed. *p.* 195.

7. COCHLEARIA.

Pouch subovate, many-seeded, their valves turgid. *Seeds* not margined, their *cotyledons* accumbent. The shorter *filaments* without teeth. *Cal.* patent.

1. C. *officinalis*, pouch globose, radical leaves petiolate cordato-reniform entire or sinuated, cauline ones sessile oblong sinuated. *p.* 195.
2. C. *anglica*, pouch elliptical, radical leaves petiolate cordate entire, cauline ones mostly sessile oblong more or less toothed near the base. *p.* 195.
3. C. *danica*, pouch ovato-elliptical, leaves all petiolate deltoid. *p.* 196.
4. C. *Armoracia*, pouch oblong, stigma dilated nearly sessile, radical leaves oblong (on long footstalks) crenate, cauline ones elongato-lanceolate serrate or entire. *p.* 196.

8. SUBULARIA.

Pouch oval, pointless (*Silic. mutica*, *Br.*), many-seeded; valves turgid. *Cotyledons* incumbent, linear, bipartite (*bicrures*).

1. S. *aquatica*. *p.* 196.

9. DRABA.

Pouch entire, oval; valves plane, or a little convex; cells many-seeded. *Seeds* not margined; *cotyledons* accumbent. *Filaments* without teeth.

1. Dr. *verna*, scapes naked, petals bipartite, leaves lanceolate somewhat cut hairy. *p.* 196.
2. Dr. *rupestris*, scapes naked or with one leaf, petals undivided, pouch lanceolate pubescent, leaves plane lanceolate hairy. *p.* 196.
3. Dr. *hirta*, scape generally with 1 or 2 ovate dentate or entire leaves, petals undivided, pouch oblong and as well as the pedicels glabrous, leaves lanceolate plane hairy and stellato-pubescent. *p.* 197.
4. Dr. *incana*, cauline leaves numerous lanceolate dentate hoary with starry pubescence, pouch oblong somewhat twisted. *p.* 197.

5. Dr. *muralis*, stem branched, leaves ovate obtuse amplexicaul dentate, pouch patent glabrous. *p.* 197.

10. CAMELINA.

Pouch subovate, many-seeded: their valves turgid. *Cotyledons* incumbent. *Filaments* without teeth.

1. C. *sativa*, pouch obovate marginated, stigma simple, leaves lanceolate sagittate. *p.* 198.

DIV. II. SILIQUOSÆ.

11. CARDAMINE.

Pod linear, with the margins truncated; valves plane, nerveless (often bursting elastically), narrower than the dissepiment.

* *Leaves pinnated.*

1. C. *bulbifera*, stem quite simple, inferior ones pinnated, superior ones undivided. *p.* 198.
2. C. *amara*, leaves pinnated, radical leaflets roundish, cauline ones dentato-angulate, style oblique, stigma acute, stem rooting at the base. *p.* 198.
3. C. *pratensis*, leaves pinnate, radical leaflets roundish dentate, cauline ones lanceolate nearly entire, style straight, stigma capitate. *p.* 198.
4. C. *impatiens*, leaves pinnate, leaflets lanceolate somewhat cut or entire, stipules ciliated, petals linear or none. *p.* 199.
5. C. *hirsuta*, leaves all pinnated and without stipules, leaflets petiolate radical ones roundish, stam. (4—6) equal in length to the petals, stigma nearly sessile. *p.* 199.

** *Leaves undivided.*

6. C. *bellidifolia*, leaves simple ovate entire upon rather long footstalks. *p.* 199.

12. ARABIS.

Pod linear, crowned with the nearly sessile stigma; valves veined or nerved. *Seeds* in one row. *Cotyledons* accumbent. *Cal.* erect.

1. A. *hispida*, radical leaves sinuato-lyrate lengthened below into footstalks, cauline ones mostly undivided glabrous, fruit-bearing peduncles spreading half as long as the pods. *p.* 199.
2. A. *thaliana*, leaves subdentate pilose, radical ones subpetiolate oblong, stam. as long as the petals, stem branched, pods ascending. *p.* 199.
3. A. *ciliata*, leaves subdentate oval glabrous ciliated, radical ones nearly sessile obtuse, cauline ones semiamplexicaul, stem simple. *p.* 200.
4. A. *hirsuta*, leaves all hispid dentate, cauline ones semiamplexicaul, pods straight. *p.* 200.

5. A. *Turrita*, leaves amplexicaul, pods recurved flat and linear with the margins incrassated, bracteas foliaceous. *p.* 200.

13. TURRITIS.

Pod elongated, 2-edged; valves nerved and keeled. *Seeds* in 2 rows. *Cotyledons* accumbent.

1. T. *glabra*, radical leaves dentate hairy, cauline ones amplexicaul entire glabrous. *p.* 200.

14. BARBAREA.

Pod 4-edged. *Cotyledons* accumbent. *Seeds* in one row. *Cal.* erect. Small *glands* placed between the shorter filaments.

1. B. *vulgaris*, lower leaves lyrate the terminal lobe rounded the superior ones obovate toothed. *p.* 200.
2. B. *præcox*, lower leaves lyrate upper ones pinnatifid their segments linear oblong and entire. *p.* 201.

15. NASTURTIUM.

Pod rounded (sometimes short); valves concave, nerveless, not carinated. *Cotyledons* accumbent. *Cal.* patent.

1. N. *officinale*, leaves pinnate, leaflets ovate subcordate sinuato-dentate. *p.* 201.
2. N. *sylvestre*, leaves pinnate, leaflets lanceolate incised those on the uppermost leaves nearly entire. *p.* 201.
3. N. *terrestre*, leaves lyrato-pinnatifid unequally toothed glabrous, root simply fibrous, petals not longer than the cal. *p.* 201.
4. N. *amphibium*, leaves oblong pinnatifid or serrated, root simply fibrous, petals longer than the cal. *p.* 201.

16. SISYMBRIUM.

Pod rounded or angular. *Cotyledons* incumbent (sometimes obliquely), plane. *Cal.* patent (sometimes nearly erect).

1. S. *officinale*, pods subulate pubescent close pressed to the main stalk, leaves runcinate hairy, stem hispid. *p.* 202.
2. S. *Sophia*, leaves doubly pinnate a little hairy, pinnules linear terminal one the longest, petals shorter than the cal. *p.* 202.

17. ERYSIMUM.

Pod 4-sided. *Seeds* not margined. *Cotyledons* incumbent. *Stigma* capitate, sometimes notched, with the lobes patent. *Cal.* closed.

1. E. *cheiranthoides*, leaves lanceolate entire or slightly toothed with stellato-tripartite hairs, pods nearly erect their peduncles spreading, stigma undivided nearly sessile. *p.* 202.
2. E. *Alliaria*, leaves heart-shaped petiolate dentato-crenate. *p.* 202.

18. CHEIRANTHUS.

Pod compressed or 2-edged. *Cotyledons* accumbent. *Cal.* closed; opposite leaflets saccate at the base. *Stigma* placed upon a style, 2-lobed, with the lobes patent or capitate.

1. Ch. *fruticulosus*, leaves lanceolate acute hoary beneath, pubescence all simple and close pressed, stem somewhat shrubby, branches angular. *p.* 202.

19. HESPERIS.

Pod 4-sided or 2-edged. *Stigma* nearly sessile, with the lobes connivent. *Cotyledons* incumbent, plane. *Cal.* closed.

1. H. *matronalis*, stem erect, leaves ovato-lanceolate toothed, limb of the petals obovate, pods erect torulose their margins simple (not incrassated). *p.* 202.

20. BRASSICA.

Pod 2-valved (with an abortive or 1-seeded beak). *Cotyledons* conduplicate. *Cal.* closed.

1. Br. *Napus*, root caulescent fusiform, leaves smooth, upper ones cordato-lanceolate amplexicaul, lower ones lyrate toothed. *p.* 203.
2. Br. *Rapa*, root caulescent orbicular depressed fleshy, radical leaves lyrate scabrous those of the stem nearly entire smooth. *p.* 203.
3. Br. *oleracea*, root caulescent rounded fleshy, all the leaves glabrous glaucous waved and lobed. *p.* 203.
4. Br. *Monensis*, leaves pinnatifid, stem nearly leafless glabrous, pods smooth, beak monospermous. *p.* 203.
5. Br. *campestris*, root and stem slender, leaves cordate acuminate amplexicaul lower ones lyrate dentate subhispid. *p.* 203.

21. SINAPIS.

Pod 2-valved (sometimes of 2 articulations, of which the upper one is valveless). *Cotyledons* conduplicate. *Cal.* patent.

1. S. *arvensis*, pods with many angles turgid and knotty longer than the 2-edged beak, leaves ovate sublyrate. *p.* 204.
2. S. *alba*, pods hispid turgid shorter than the ensiform beak, leaves pinnatifid. *p.* 204.
3. S. *nigra*, pods appressed glabrous tetragonous, style short subulate, upper leaves linear-lanceolate entire glabrous. *p.* 204.
4. S. *tenuifolia*, pods linear glabrous shortly beaked erect, peduncles spreading, leaves lanceolate very acute pinnatifid or bipinnatifid, stem glabrous. *p.* 204.

22. RAPHANUS.

Pod valveless (torulose *Sm.*). *Cotyledons* conduplicate. *Cal.* closed.

1. R. *Raphanistrum*, leaves simply lyrate, pods of one cell jointed striated. *p.* 204.
2. R. *maritimus*, leaves interruptedly lyrate, pods of one cell jointed striated. *p.* 204.

ORDER LXVI. FUMARIEÆ. *Decand.*

Cal. (*bracteæ?*) of two leaves. *Petals* (*sepals?*) 4, irregular, in two series, the upper one saccate at the base. *Stamens* definite, in two bundles, opposite the outer *petals*. *Anthers* turned outwards. *Ovary* 1, 1-celled, 1- or many-seeded. *Style* simple. *Stigma* horned. *Fruit* either a little 1-seeded *drupe*, or a 2- or many-seeded *capsule*. *Seeds* attached by their middle. *Embryo* very minute, in the base of a fleshy *albumen*. *Radicle* opposite the *hilum*.

Herbs with climbing *shoots* and divided *leaves*. *Flowers* in *spikes*.

1. FUMARIA.

Cal. small, of 2 *leaves*. *Pet.* 4, irregular, one of them gibbous at the base. *Filaments* 2, membranaceous, each bearing 3 *anthers*.

* *Capsule sphærical, 1-seeded.*

(*Fumaria.*)

1. F. *officinalis*, spike lax, stem branched spreading, leaves bipinnate, leaflets almost linear. *p.* 210.—*Corn-fields.*
2. F. *capreolata*, spike lax, stem climbing by means of the tendril-like petioles, leaves triternate, leaflets obovato-cuneiform cut and lobed. *p.* 210.—*Hedges.*

** *Caps. linear, 2- or more seeded.*

(*Corydalis, Dec.*)

3. F. *claviculata*, spikes lax, stem climbing pinnate, leaflets 3—5-partite, lobes ovato-acute, petioles ending in tendrils. *p.* 211.—*Rocks.*

ORDER LXVII. PAPAVERACEÆ. *Juss.*

Cal. of 2—4 *leaves*, deciduous. *Cor.* of 4—8 *petals*. *Stamens* indefinite. *Ovary* 1. *Stigma* lobed. *Capsule* one-celled, many-seeded. *Placenta* parietal, 2- or many-parted. *Seeds* with a caruncule. *Embryo* in the base of a fleshy *albumen*.

Milky plants. *Leaves* alternate. *Flowers* spicate, umbellate, or solitary. *Mirb.*

1. PAPAVER.

Cal. 2-leaved, caducous. *Petals* 4. *Stigma* radiated. *Caps.* discharging its *seeds* by *pores* under the permanent *stigma.*

* *Capsules hispid.*

1. P. *Argemone*, capsules clavate hispid, stem leafy many-flowered. *p.* 168.—*Corn-fields.*

** *Capsules glabrous.*

2. P. *dubium*, capsules glabrous oblong, stem many-flowered hairy, bristles of the flowerstalks appressed, leaves pinnatifid. *p.* 168.—*Corn-fields.*
3. P. *Rhœas*, capsules glabrous nearly globose, stem many-flowered bristly, bristles of the flowerstalks (as well as of the stem) spreading, leaves pinnatifid. *p.* 168.—*Corn-fields.*
4. P. *somniferum*, capsule globose glabrous, stem many-flowered and as well as the glaucous amplexicaul leaves glabrous. *p.* 168.
5. P. *cambricum*, capsules glabrous oblong, stem many-flowered nearly glabrous, leaves pinnated, leaflets petiolate ovato-lanceolate cut. *p.* 168.—*Woods.*

2. CHELIDONIUM.

Cal. of 2 *leaves*, caducous. *Pet.* 4. *Stigma* 2-lobed. *Pod* linear, 1-celled, of two valves. *Seeds* numerous, crested, free.

1. Ch. *majus*. *p.* 167.—*Waste places.*

3. GLAUCIUM.

Cal. of 2 *leaves*, caducous. *Pet.* 4. *Stigma* 2-lobed. *Pod* linear, 1-celled, of 2 valves. *Seeds* numerous, dotted, imbedded in a spongy substance which fills the *pod.*

1. G. *luteum*, peduncles 1-flowered, leaves (of the stem) amplexicaul sinuate, stem glabrous. *p.* 167.—*Sea-coasts.*

ORDER LXVIII. NYMPHÆACEÆ. *Salisb.*

Cal. of 4—5 *leaves*, not articulated with the *receptacle*. *Pet.* and *stam.* disposed in many rows, alternate with the *sepals*. *Anthers* turned inwards, adnate. *Berry* many-celled, many-seeded. *Embryo* large, in the base of a fleshy *albumen.*

Water plants. *Leaves* on long stalks, their *nerves* radiating. *Peduncles* without *bracteæ*, 1-flowered.

1. NYMPHÆA.

Cal. of 4—5 *leaves*. *Pet.* numerous, inserted upon the *germen* beneath the *stamens*. *Berry* many-celled, many-seeded.

1. N. *alba*, "leaves cordate, stigma of 16 ascending rays." *p.* 169.—*Lakes and ditches.*

2. NUPHAR.

Cal. of 5—6 leaves. *Pet.* numerous, inserted as well as the *stam.* upon the *receptacle.* *Berry* superior, many-celled, many-seeded.

1. N. *lutea*, leaves cordate, their lobes approximate, cal. of 5 leaves, stigma expanded (entire) with from 14—20 rays. *p.* 169.—*Lakes, &c.*
2. N. *Kalmiana*, leaves cordate, their lobes subapproximate, stigma cut (toothed, *Sm.*) with from 8—12 rays. *p.* 169.—*Lakes.*

ORDER LXIX. BERBERIDEÆ. *Juss.*

Sepals in two rows, deciduous. *Petals* opposite the *sepals.* *Stamens* equal to the *petals* in number and opposite them. *Anthers* adnate, opening with a *valve* from the base upwards. *Ovary* 1. *Seeds* generally attached laterally. *Embryo* straight, in the axis of a fleshy *albumen.*

Shrubs or *Herbs.* *Leaves* alternate, generally compound; *flowers* in racemes, furnished with *bracteæ.* *Dec.*

1. BERBERIS.

Cal. of 6 *leaves.* *Cor.* of 6 *petals.* *Stam.* 6. *Berry* 2-seeded.

1. B. *vulgaris,* racemes pendulous, spines 3-forked, leaves obovate ciliato-serrate. *p.* 111.—*Hedges.*

2. EPIMEDIUM.

Cal. of 4 *leaves,* caducous. *Pet.* 4, with an inflated *nectary* on the upper side. *Stam.* 4. *Pod* of 1 *cell,* 2 *valves,* many *seeds.*

1. E. *alpinum.* *p.* 55.

ORDER LXX. RANUNCULACEÆ. *Juss.*

Cal. with many definite *sepals,* or many-parted. *Petals* definite or indefinite, sometimes wanting. *Stamens* indefinite. *Anthers* adnate, generally turned outwards. *Ovaries* many, 1-celled. *Seeds* attached to their inner side. *Embryo* minute, straight, placed in the base of a corneous *albumen.*

Herbs or *Undershrubs.* *Leaves* simple, variously lobed, usually alternate, with stalks more or less dilated at their base. *Dec.*

1. CLEMATIS.

Cal. (*Pet.*, *Sm.*) of 4—6 leaves. *Pet.* none. *Pericarps* terminated by a long, mostly feathery awn. (*caudate*).

1. Cl. *vitalba*, stem sarmentose, leaves pinnate, leaflets cordato-ovate inciso-lobate, petioles scandent, peduncles rather shorter than the leaves. *p.* 171.

2. THALICTRUM.

Cal. (*Pet.*, *Sm.*) of 4—5 leaves. *Pet.* none. *Pericarps* without awns (ecaudate).

1. Th. *alpinum*, stem simple nearly leafless, raceme simple terminal, flowers drooping, segments of the leaves glabrous. *p.* 171.
2. Th. *minus*, leaves tripinnate, leaflets trifid glaucous, flowers panicled drooping. *p.* 172.
3. Th. *majus*, "leaves tripinnate, leaflets lobed" (mostly trifid), "branches of the panicle subumbellate, flowers drooping." *p.* 172.
4. Th. *flavum*, stem erect branched furrowed, leaves bipinnate, leaflets wedge-shaped trifid, panicle much branched subcorymbose, flowers erect. *p.* 172.

3. ANEMONE.

Involucre of 3 divided leaves, distant from the flower. *Cal.* (*Cor.*, *Sm.*) petaloid, of 5—9 leaves. *Pet.* none. *Pericarps* with or without awns.

1. A. *nemorosa*, leaves ternate lobed and cut, involucre the same petiolate, stem single-flowered, capsules without awns. *p.* 171.

4. ADONIS.

Cal. of 5 leaves. *Pet.* 5—10, without any nectary. *Pericarps* without awns.

1. A. *autumnalis*, petals concavo-connivent scarcely longer than the glabrous cal., pericarps reticulate collected into an ovate head, stem branched. *p.* 172.

5. RANUNCULUS.

Cal. of 5 leaves. *Pet.* 5—10, with a nectariferous pore at the base. *Pericarps* without awns. (In R. *Ficaria* there are 3 cal. leaves and many petals.)

* *Pericarps transversely wrinkled. Petals white; claw yellow, with a nectariferous pore.* (Decand.)

1. R. *aquatilis*, stem floating submersed, leaves capillaceo-multifid, floating ones tripartite their lobes cut, petals obovate larger than the cal., pericarps glabrous or hispid. *p.* 173.

β. all the leaves capillaceo-multifid.

2. R. *hederaceus*, stem creeping, leaves roundish kidney-shaped with 3—5 rounded entire lobes, petals small scarcely longer than the cal., stam 5—10, pericarps glabrous. *p.* 173.

* *Pericarps smooth or echinated (not transversely wrinkled). Petals with a small scale at the base.* (Decand.)

† *Flowers white.*

3. R. *alpestris*, leaves glabrous orbicular deeply 3-lobed, lobes

at the extremity lobulato-crenate, stem mostly 1-flowered, petals obcordate *p.* 173.

†† *Flowers yellow. Leaves undivided.*

4. R. *Lingua*, leaves lanceolate subserrated sessile semiamplexicaul, stem erect glabrous. *p.* 173.
5. R. *Flammula*, leaves linear lanceolate nearly entire petiolate the lower ones ovato-lanceolate, stem declined rooting at the base.

β. much smaller, stem creeping filiform. *p.* 174.

6. R. *Ficaria*, leaves heart-shaped petiolate angular or crenate, cal. of 3 leaves, petals 9. *p.* 174.

††† *Flowers yellow. Leaves variously divided.*

+ *Root perennial. Capsules smooth.*

7. R. *auricomus*, leaves glabrous radical ones reniform 3-partite and cut, stem leaves divided to the base into linear subdentate segments, cal. pubescent shorter than the petals. *p.* 174.
8. R. *sceleratus*, leaves glabrous radical ones petiolate tripartite, lobes cut very obtuse upper ones into 3 linear incised segments, calyx glabrous, capsules collected into an oblong spike. *p.* 174.
9. R. *acris*, cal. spreading, peduncles rounded, (not furrowed,) leaves tripartite their segments acute 3-fid and cut upper ones linear. *p.* 174.

β. *minor*, stem 1—2-flowered.

10. R. *repens*, calyx spreading, flowerstalks furrowed, scions creeping, leaves cut into 3 petiolated leaflets which are 3-lobed or 3-partite and cut. *p.* 175.
11. R. *bulbosus*, calyx reflexed, peduncles furrowed, stem upright many-flowered, leaves cut into 3 petiolated leaflets, which are 3-lobed or 3-partite and cut, root bulbous. *p.* 175.

++ *Roots annual. Capsules tuberculate or muricated.*

12. R. *hirsutus*, cal. reflexed, stem erect many-flowered hairy, leaves 3-lobed or 3-partite, lobes obtuse cut, root fibrous, capsules margined and tuberculated. *p.* 175.
13. R. *arvensis*, cal. spreading, stem erect many-flowered, leaves three-cleft their segments generally again 3-cleft into linear entire or bi- tridentate segments, capsules muricated. *p.* 175.

6. MYOSURUS.

Cal. of 5-leaves, prolonged at the base, *pet.* 5, their claws tubular, filiform, *pericarps* collected upon a very small receptacle. *Stam.* 5 to 12.

1. M. *minimus*, *p.* 98.—*Fields.*

7. TROLLIUS.

Cal. (*Cor.*, *Sm.*) of 5, or many leaves. *Pet.* (*Nect.*, *Sm.*) 5

or many, minute, tubular at the base. *Capsules* cylindrical, many-seeded.

1. Tr. *europæus*, leaves of the cal. (*cor.*, *Sm.*) 15 concavo-connivent, petals (*nect.*, *Sm.*) as long as the stam. *p.* 176.

8. HELLEBORUS.

Cal. (*Cor.*, *Sm.*) of 5 petals, subcoriaceous, persistent. *Pet.* (*Nect.*, *Sm.*) 8—10, very small, tubular, somewhat two-lipped, nectariferous. *Capsules* compressed, nearly erect, many-seeded.

1. H. *viridis*, stem few-flowered leafy, leaves digitate, cal. spreading. *p.* 176.
2. H. *fœtidus*, stem many-flowered leafy, leaves pedate, cal. concavo-connivent. *p.* 176.

9. CALTHA.

Cal. (*Cor.*, *Sm.*) of 5 leaves, petaloid. *Pet.* none. *Caps.* several, compressed, spreading, with many seeds.

1. C. *palustris*, leaves cordate crenate. *p.* 176.

β. stem creeping, leaves cordato-triangular. *p.* 176.

γ. leaves cordate nearly entire. *p.* 176.

PLANTS OF WHICH THE SITUATION IS UNCERTAIN.

1. PARNASSIA.

Cal. 5-parted, persistent. *Pet.* 5, hypogynous, alternate with the calyx. *Scales* 5, inferior, inserted into the claws of the petals, fringed with cilia bearing a round gland at their end. *Stamens* 5, hypogynous, alternate with the petals. *Anthers* incumbent. *Ovary* 1. *Style* none. *Stigmas* 4, persistent, with a hole between them. (*Juss.*) *Capsule* 1-celled, 4-valved. *Valves* bearing the incomplete dissepiments in their middle. *Seeds* very numerous, winged on one side, attached to the margin of the dissepiments. *Albumen* none. *Embryo* cylindrical. *Cotyledons* very short, obtuse. *Radicle* long, straight, centrifugal. (*Gærtn.*)

1. P. *palustris*. *p.* 97.—*Bogs.*

It is much to be regretted, that so beautiful a plant as this should have no certain station assigned it in any natural arrangement; and the more so because its structure is completely understood. Probably it is, as Ventenat has supposed, one of those genera which constitute distinct orders of themselves; just as many solitary species constitute distinct genera. M. de Jussieu, in his *Genera Plantarum*, placed it next *Drosera* and *Reseda*, among the genera supposed to be akin to *Capparides*. Adanson arranged it among his *Cisti*. Sir James Smith has conjectured it might be related to *Saxifraga* and *Dionæa;* and we believe Mr. Brown is disposed to favour the opinion of its affinity to the former genus. There are others who consider it more near *Hy-*

pericinæ, an idea which its structure very much confirms, notwithstanding its difference in habit. The fringed bodies, which are conveniently enough called Nectaries, appear so very analogous to the bundles of stamens in *Hypericum,* that we confess we should have had little doubt in our own minds of its actually belonging to *Hypericinæ,* if the most learned botanist of his age had not formed an opinion to the contrary.

2. EMPETRUM.

Diœcious. *Cal.* 3-parted, persistent. ♂. *Petals* 3, withering. *Stamens* 3. *Filaments* long. *Anthers* 2-partite. ♀. *Ovary* superior depressed. *Style* none, or very short. *Stigmas* nine, reflexed, spreading. *Juss.* *Berry* round, 1-celled. *Seeds* 2—3 or more, erect, bony. *Embryo* upright, in the axis of a fleshy albumen. *Radicle* inferior. *Gærtn.*

1. E. *nigrum,* procumbent, leaves linear-oblong. *p.* 287.—*Mountainous heaths.*

Jussieu has placed this singular genus, along with *Hudsonia,* at the end of *Ericeæ.* Adanson arranged it with his *Cisti.* But we think Mr. Nuttall has taken a more correct view of its affinity, in placing it, as a distinct order which he proposes to call *Empetreæ,* at the end of *Coniferæ.* We quite agree with him in thinking that the principal resemblance between it and *Ericeæ* consists in the leaves.

3. CERATOPHYLLUM.

Monœcious. *Cal.* many-parted. *Cor.* 0. ♂. *Stam.* twice as many as the divisions of the calyx. *Anthers* oblong. ♀. *Ovary* 1, compressed. *Style* none. *Stigma* oblique. *Juss.* *Nut* bony, 1-celled, indehiscent. *Seed* erect. *Albumen* none. *Embryo* with 4 *cotyledons,* of which two are larger than the rest. *Plumula* of many leaves.

1. C. *demersum,* fruit armed with 3 spines. *p.* 272.—*Ditches.*

We suspect there is something still to discover, with respect to the male flowers at least, in this genus. Its affinity has scarcely been mentioned. For some time it floated among *Jussieu's Naiades;* till it was ascertained that it was a dicotyledonous plant. Since that time, the only author we are acquainted with who has noticed it is M. Richard, who has hinted at a resemblance existing between it and *Coniferæ.*

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